IDG.net NT Server 4.0 phaseout in the works. PAGE 8
Columnist Dan Gillmor: Doors may be opening to Linux. PAGE 25

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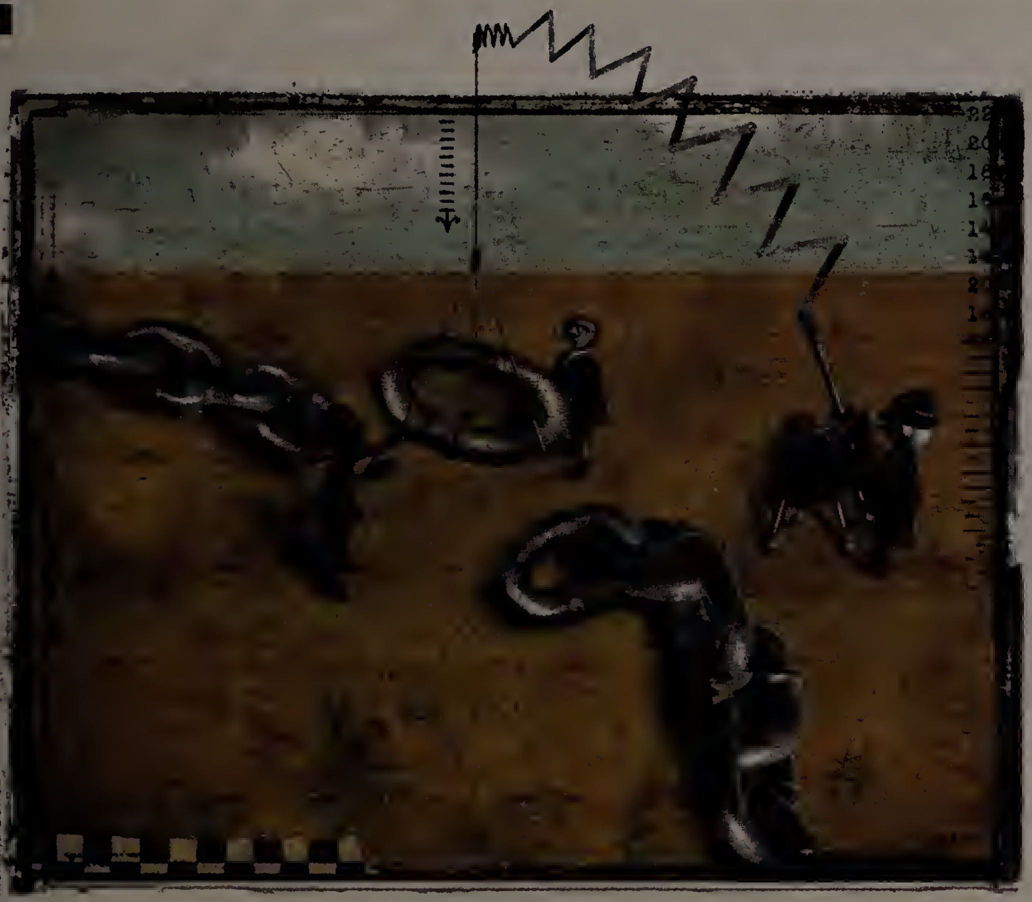
RICHARD BORGE

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KNOWLEDGE CENTER SPECIAL REPORT

Supply Chain

Missing Links

And you thought ERP was hard. Supply chain integration projects are at least as tough to pull off. IT managers handling these projects often face midstream budget cuts, elusive ROI, turf wars, dirty data and the challenge of getting thousands of small, fax-happy suppliers automated.

Special Report begins on page 27.

OPINION SPLIT ON NEW ORACLE PRICING

Some users like plan; others face cost jumps

BY MARC L. SONGINI

User reaction to the database pricing scheme that Oracle put in place six months ago has been mixed, with some IT managers applauding the approach and others saying their software licensing fees will increase if they don't invest in servers with faster processors.

Rich Niemiec, president of the Chicago-based International Oracle Users Group-Americas, said last week that user complaints have dropped dramatically since Oracle Corp. replaced its controversial Universal Power Unit formula with a per-processor pricing plan. "Since UPU pricing was killed, I've not heard a pricing gripe," Niemiec said.

But some database administrators claim that the per-processor pricing could actually result in higher costs in some cases, especially if users are running low-end servers with multiple processors.

Oracle, page 16

USER DOUBTS RISE OVER HP, COMPAQ

Product plans, merger outcome both unclear

BY LEE COPELAND

VENDORWATCH

The melodrama surrounding the proposed merger of Hewlett-Packard Co. and Compaq Computer Corp. is leading some users to re-examine their relationships with the two vendors.

A tense proxy fight looms, as HP and Compaq last week vowed to proceed, despite opposition to the deal from the heirs of both the Hewlett and the Packard families, who control a total of 18% of HP's stock. Users may not know until February whether the merger will be approved by shareholders of the two companies.

That may not be soon enough for Garrettsville, Ohio-based Therm-O-Link Inc. The supplier of cable and wire started looking for a new server platform after HP last month announced plans to phase out its HP e3000 system. But it's leaning against a switch

HP/Compaq, page 57

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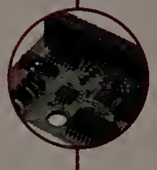

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6 IT workers laid off after the collapse of Enron may end up competing with one another for the small number of jobs available in Houston.

7 The nine states that haven't signed on to Microsoft's settlement deal with the government want Office to be supported on Linux.

8 Microsoft plans to stop selling Windows NT Server 4.0 by mid-2003 and drop technical support of the software at the end of that year.

10 The Sept. 11 attacks have prompted a reversal of the trend toward centralization of IT resources at some companies.

12 The Interior Department is wrestling with data security problems that forced a shutdown of its various Web sites.

57 Aetna is cutting 150 IT jobs as part of wider layoffs, but the insurer said that shouldn't derail its new CIO's reorganization plans.

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Emerging Company: PentaSafe Security Technologies Inc.
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ILLUSTRATIONS BY RICHARD BORGE

KNOWLEDGE CENTER SPECIAL REPORT: Supply Chain

27 Missing Links

There's bad news everywhere: a recession in manufacturing, a recession in the supply chain software market and post-Sept. 11 disruptions in the transportation system. Meanwhile, supply chain projects are plagued by funding cutbacks, cynicism and dirty data. And yet bringing more efficiency and resiliency to your supply chain has never been more important.

30 Patching the Supply Chain

The automotive industry's Covisint exchange is getting mixed reviews in its second year as it relies on third-party software to fill in gaps in its offerings.

34 Kinks in the Chain

Experts identify 10 major barriers to overcome on the path to supply chain nirvana — from departmental warfare to sabotage from well-meaning employees.

36 Your Crystal Ball

This Field Report takes a look at demand planning software, which helps you predict how many of which items will be needed where, and at what time.

ONLINE: IT managers who have deployed demand planning systems in the field offer some tips.
www.computerworld.com/q?25432

42 Dirty Data

Incomplete, inaccurate and poorly formatted data can ruin even a great piece of supply chain software. The trick is to have a continuous campaign to make sure data entering the system is clean — and then stays that way.

ONLINE: A recent study says data quality is too important to be left to CIOs; it's a boardroom issue.
www.computerworld.com/q?25303

44 Beyond Paper Clips

Buying office supplies online is one thing. But it will take time — and more mature software — before companies will trust online procurement for the purchase of mission-critical parts for their assembly lines.

46 Just in Case

The supply chain disruptions since Sept. 11 are causing managers to rethink their nearly religious devotion to just-in-time inventory. Now the talk is of "safety stocks" and resilience.

48 The Weakest Link

Small businesses are happy with their fax machines and spreadsheets, which makes it hard to get them to jump on the supply chain automation bandwagon. Maybe Web-based services can help convince them.

ONLINE: Read how a $9 billion company approaches its global supply chain challenges.
www.computerworld.com/q?25233

Also in This Week's Knowledge Center:

32 QuickStudy: Learn the basics of supply chain management.

40 Kevin Fogarty warns you not to forget the human middleware when you're building a supply chain system.

50 Nicholas Petreley says CIOs are wising up to open standards.

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Gaining Visibility

Dresser Flow Control uses Vigilance event management software as a second set of eyes to identify supply chain problems and alert staff members.
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Quick Link

Managing the People Supply

Online procurement tools aren't just for widgets. Companies can use them to acquire contract workers and consultants, too.
www.computerworld.com/q?25163

The Cost Cutters

IT managers versed in the sound management of logistics, procurement and distribution can make a difference in something that hits home at many companies right now: controlling costs.
www.computerworld.com/q?25579

BRIEFS

Microsoft Releases New Patch for IE

Microsoft Corp. urged users to install a software patch designed to plug three newly discovered security holes affecting Versions 5.5 and 6.0 of its Internet Explorer Web browser. Microsoft assigned its highest severity rating to the problems addressed by the patch, which also includes fixes for all holes that had previously been identified in the two browser releases.

Bush to Hire Microsoft Security Chief?

Sources said President Bush is expected to appoint Howard Schmidt, currently Microsoft's chief security officer, to be vice chairman of the new Critical Infrastructure Protection Board. Schmidt would work with national cybersecurity czar and board chairman Richard Clarke on protecting systems in industries such as energy and transportation.

CERT Warns Users to Secure Unix Servers

Citing increased activity by hackers, the CERT Coordination Center at Carnegie Mellon University in Pittsburgh warned administrators of Unix systems running the Secure Shell (SSH) utility to make sure all known security holes are plugged before taking holiday vacations. SSH provides secure remote terminal connections and file transfers between end users and servers.

BellSouth, Qwest Plan More Layoffs

Atlanta-based telecommunications services provider BellSouth Corp. announced plans to cut 1,200 more jobs, just two months after laying off 3,000 employees. BellSouth's move also came just a day after Denver-based Qwest Communications International Inc. said it would lay off another 7,000 workers.

Laid-off Enron IT Workers Join Houston's Jobless

Former colleagues now compete against one another for limited number of jobs

BY MELISSA SOLOMON

HUDDLED with a box of his belongings, Chris Sanchez stared in shock at the circus around him: news helicopters flying overhead, police on horseback ushering along thousands of laid-off workers as they hugged and kissed farewell, reporters frantically scratching away in notebooks.

"It was so much confusion, so many people," Sanchez said of the scene outside Enron Corp.'s Houston headquarters after it laid off thousands of workers this month.

Since Dec. 3, the day he lost his job as a Unix systems administrator at EnronOnline, Sanchez has been able to make some sense of the situation with help from some of his 4,500 former colleagues who were also let go after the $101 billion energy trading firm filed for bankruptcy protection.

But Sanchez is already finding that many of those colleagues are also his competitors for the scarce IT jobs available. The Houston job market is very tight because, in addition to the thousands of layoffs at Enron, two other big local employers, Continental Airlines Inc. and Compaq Computer Corp., each recently cut about 3,000 jobs. And Compaq is expected to make a large number of additional layoffs if its merger with Hewlett-Packard Co. goes through.

Houston's Not Alone

Houston is just the latest city to be blindsided by a sudden swelling in the ranks of its unemployed. Last year's dot-com layoffs were tough, but with the titans of industry lining up to announce mass layoffs, many regional IT job markets have been crippled.

"I hurt for those people," said Jennifer Tarver, a senior recruiter at Houston-based Richard, Wayne & Roberts (RWR), which has placed scores of Enron IT workers over the years. "I really felt with all my heart that when we helped people get there, that it was the golden palace."

THE ASSOCIATED PRESS

ENRON EMPLOYEES in Houston stand outside the company's headquarters Dec. 3 after the firm announced thousands of layoffs.

In the past two weeks, Tarver has been inundated with calls from former clients who are now out of work. Some IT jobs are available at local energy companies, but there aren't enough to go around, she said. RWR has traditionally focused on Houston employers, but it has recently expanded its reach. IT workers will likely have to do the same, she added.

"To be a marketable candidate right now, I believe that you're going to have to be flexible on your pay and willing to move and look outside the energy industry," Tarver said.

Some former Enron workers were hit by more than the loss of salary and benefits. Hundreds of holders of H-1B visas (temporary work permits for foreign workers) were reportedly employed at the company, and they may be forced to leave the country if they can't find new jobs immediately.

With Enron's stock prices hovering well below $1, many employees have also lost the bulk of their retirement savings, and their severance payments, previously based on length of service, have been slashed to $4,500 per person. ▶

Workers Blindsided by Enron's Demise

Enron rose to glory on the concepts of transparency and communication in the marketplace. Throughout its 50-story glass headquarters, TV monitors and stock tickers kept workers on top of world events.

But when the Enron empire began to crumble, communication and transparency got lost in the wreckage, said former workers. In fact, many first heard about Enron's troubles from those very televisions, said Chris Sanchez, a former Unix systems administrator at EnronOnline.

"It was shocking and aggravating to be totally blindsided," said Hector Ruiz, who was laid off from Enron's networking, telecommunications and PC support unit.

Like his colleagues, Jose Lazo, a former SQL database administrator at Enron, was stunned by the mass layoffs of Dec. 3.

"We came back Monday from the weekend. Everything was fine. Then, at about 10, the network shut down," he recalled. "Nothing was working. We were like, 'What's going on?' "

By 11 a.m., supervisors reading from prepared scripts went floor by floor telling workers to go home and wait for a call to see if they still had jobs, said Sanchez. He spent more than six hours by the phone. Frustrated, he sent e-mails to the work addresses of several colleagues. Those whose messages didn't bounce back still had jobs, he concluded. His came back.

Enron has created an "alumni" resource site, with information about severance checks, job fairs and termination information, and it plans to create a site where former workers can post their résumés. But only 3,000 people remain out of a Houston workforce that once numbered 7,500, and a spokeswoman at the company's headquarters acknowledged that there's no way they can keep up with all of the requests for information.

Fending off restlessness, Lazo worked through the night on Dec. 3 to create Enronx.org, one of a handful of Web sites for former workers. The site, which spoofs the design of the Enron corporate site, contains resources on health care, finances, government investigations into Enron, class-action suits and job and message boards.

With help from Techxans, a local IT networking group that helped Lazo compile the resources for the site, the Enronx.org development team also threw a pink-slip party for laid-off workers on Dec. 7. "They didn't have a going-away party, so this was a chance for them to get together," said Leslie Plotkin, a spokeswoman for Techxans. "They were a team, and they still are a team."

Ahmad Farooqi, who worked in the gas-trading support group at Enron, said he's still grateful for the experience and training he got at Enron.

But Ruiz said his eyes have been opened. "I've learned not to trust any word that comes down from the top," he said.

– Melissa Solomon

Holdout States Want Microsoft Office Ported to Linux

Corporate users say they're unlikely to give up Windows

BY PATRICK THIBODEAU
WASHINGTON

MICROSOFTSUIT

The nine holdout states that want tougher remedies imposed on Microsoft Corp. are attempting to weaken the software giant's desktop monopoly by giving the Linux operating system something it could really use: the Office productivity suite.

The idea of the dominant desktop application suite running on Linux got an enthusiastic thumbs-up from Matthew Szulik, president and CEO of Red Hat Inc., a Research Triangle Park, N.C.-based open-source software developer. "It would be fantastic," Szulik said. "It would only enhance the availability of Linux in the enterprise."

But corporate end users aren't so sure that this proposed remedy, sought by states that have refused to endorse the U.S. Department of Justice's settlement with Microsoft, would encourage Linux desktop adoption.

IT manager Dan Orr, who is responsible for about 700 desktop PCs at Kokosing Construction Co. in Fredericktown, Ohio, estimated that he could run a Linux/Office combination on about 75% of his systems. But the remaining 25% would still need to use Windows because they run other Windows-based applications, so it's a switch he's not likely to make. A mixed operating systems environment "would be tougher than maintaining just one," Orr said.

Favoring Windows

Despite the overwhelming dominance of Office, it's the many other Windows-based applications that will keep business users on Windows, according to corporate managers. "There would be no compelling reason to change," said David Rose, a project leader at American Eagle Outfitters Inc. in Warrendale, Pa.

In a remedy plan filed earlier this month, the dissenting states, led by California, Iowa and Connecticut, also called for Microsoft to sell a stripped-down, lower-cost version of Windows that would allow PC makers to add "cafeteria-style" middleware applications of their own choosing. In addition, these states want the company's Internet Explorer code to become open-source.

But a requirement that Microsoft port Office to other operating systems may be the key remedy they're seeking. Supporters of the states' case, including Robert S. Bork, the former U.S. solicitor general who has been advising industry groups opposing Microsoft, say the company's application software is artificially withheld from parts of the market for the sole purpose of maintaining the operating system's monopoly.

On the face of it, a Linux/Office combination could be appealing. If a company bought 10,000 copies of Windows XP at $179 per copy, the bill would be more than $17 million — vs. a few dollars for a Linux operating system that could be freely duplicated. Microsoft would also lose its ability to control Office's pricing under a remedy provision forcing the company to auction Office to third parties that want to port it to other operating systems.

Linux holds about 2% of the desktop operating system market, according to Dan Kusnetzky, an analyst at IDC in Framingham, Mass. While a Linux/Office combination would help Linux, its desktop market share would likely remain in the single digits, he said. Business users would be reluctant to move to Linux because of training issues, development concerns and the need to run other Windows-only applications, Kusnetzky said.

Minimal Effect

Microsoft said in court papers filed last week that there is "no plausible basis" upon which to assert that porting Office to Linux and other operating systems would have any affect on the "applications barrier to entry" faced by other operating systems. Some analysts agreed.

David Smith, an analyst at Stamford, Conn.-based Gartner Inc., noted that the availability of Office on Apple Computer Inc.'s Mac OS hasn't spurred corporate adoption of Apple's systems.

"You've already got Office on the Macintosh — has it really made the Macintosh?" said Smith. "I don't know of many corporations that want to get rid of Microsoft."

"I think everybody in the world is probably looking for some competitive desktop operating system, but I don't think that anybody wants to switch," said Robert Hacker, systems manager at Binney & Smith Inc. in Easton, Pa., the maker of Crayola crayons. Hacker said that while the idea of moving to Linux is intriguing, he would have to see a "critical mass" of adoption before he would consider it. ◗

Will Harsher Medicine Work?

The nine states that refused to endorse the Justice Department-led antitrust settlement have submitted their own remedy plan. Microsoft responded to it last week. Here are highlights of each side's argument:

Opening Internet Explorer

States: Microsoft should make the Internet browser code available as open source. "Given that Microsoft's browser dominance was achieved to bolster the operating system monopoly, the remedial prescription must involve undoing that dominance."

Microsoft: "Microsoft would no longer have any incentive to improve the Web browsing functionality of its operating systems if it were required to give away all of its innovations."

Porting Office to Other Operating Systems

States: "The applications barrier to entry can be eroded only when consumers can obtain significant software application functionality from their computers through means other than Microsoft's monopoly operating system."

Microsoft: That would constitute "the effective confiscation of Microsoft's valuable intellectual property."

Stripping Down Windows

States: Microsoft should offer a stripped-down, lower-cost version of Windows that would enable PC makers to add middleware of their own choosing.

Microsoft: "Unworkable."

Settlement Is Tough Sell to Congress

Microsoft took a step last week to begin complying with its proposed antitrust settlement, appointing two attorneys to oversee the process. But despite that move, the company's antitrust-related legal problems are far from settled.

Microsoft and the Department of Justice are having a hard time selling this settlement, and skepticism was rife at a U.S. Senate Judiciary Committee hearing last week.

"I find many of the terms of the settlement to be either confusingly vague, subject to manipulation or both," Committee Chairman Patrick Leahy (D-Vt.) said.

The ranking Republican, Orrin Hatch of Utah, expressed similar doubts about the proposed settlement. To make his points, he read at length from a letter written by former Netscape Communications Corp. CEO Jim Barksdale, whose company played a major role in triggering the government's antitrust case.

"If these provisions are allowed to go into effect," wrote Barksdale of the settlement, "no entity will be able to secure venture capital financing to compete against Microsoft in any aspect of its business."

The Senate has no real authority in this case; in holding the hearing, the committee was exercising its power of oversight of the Justice Department. The settlement is undergoing a Tunney Act review by U.S. District Judge Colleen Kollar-Kotelly, who must decide whether it's in the public interest.

Kollar-Kotelly may be influenced by the skepticism of some Senate leaders, but then again, she may not, said legal experts. "You can't dismiss it; we're all human beings," said Steven Newborn, a former Federal Trade Commission antitrust litigation chief, discussing the potential influence of the hearing. Newborn now works in the Washington office of the law firm Clifford Chance Rogers & Wells LLP.

Charles James, the U.S. assistant attorney general in charge of the Justice Department's antitrust division, defended the agreement, saying it was tailored to address the wrongs cited by the courts while establishing a set of remedies that would ensure competition. He said the department rejected suggestions from critics that it should have taken further measures, such as excluding Microsoft from markets other than operating systems, requiring the company to make its code open-source or restricting its ability to integrate new products with the operating system.

"While it is certainly true that restrictions and requirements of this sort might be desirable and advantageous to Microsoft's competitors, they would not necessarily be in the interest of competition and consumers overall," said James. "Many would reduce consumer choice rather than increase it."

– Patrick Thibodeau

Microsoft to Wind Down Support for Windows NT 4.0

Users say they'd like support for Windows 2000 Server for at least two more years

BY CAROL SLIWA

CORPORATE USERS can plan ahead now that Microsoft Corp. has disclosed the support discontinuance dates for the 5-year-old Windows NT Server 4.0 operating system.

As of Jan. 1, 2003, users will no longer be able to obtain nonsecurity Quick Fix Engineering, or hot fixes, for free. A year later, such nonsecurity hot fixes will cease to be available, even for a fee. Premier and pay-per-incident support will also end for Windows NT Server 4.0 at the start of 2004.

Users said the support end dates are reasonable and shouldn't present any hardships for their companies — especially since many of them are in the process of moving to Windows 2000 Server.

Al Gillen, an analyst at IDC in Framingham, Mass., noted that Windows NT Server accounted for approximately 80% of Microsoft's Windows server shipments last year. But this year, Windows 2000 Server will comprise the vast majority, he said.

Roger Gariepy, chief information technologist at Air Products and Chemicals Inc. in Allentown, Pa., which is about halfway into its Windows 2000 Server migration, said the support end dates for Windows NT Server are "adequate." Gariepy said his upgrade strategy takes into account that when Microsoft releases a new version of a product, the software vendor generally still supports the version that preceded it.

"You get forced into doing some upgrades, but you've got to move forward, too," said Wayne Richards, a senior technical support analyst at The Goodyear Tire & Rubber Co. in Akron, Ohio. Richards said he understands that vendors must eventually discontinue support. "You can't support everything, and [Microsoft was] getting stretched thin a bit on the number of operating systems they were supporting," he said.

Server Group to Follow Suit

In addition to several desktop operating systems, Microsoft now supports three server operating systems — Windows 3.5x, Windows NT 4.0 and Windows 2000. Support for Windows 3.5x is scheduled to stop at year's end. The support end date for Windows 2000 has yet to be announced.

Microsoft group product manager Bob O'Brien said his company "proactively sought customer feedback" in making its decision on the support end dates for Windows NT Server 4.0. Microsoft will engage in a similar exercise beginning next year with Windows 2000 Server users, O'Brien said, adding that he doesn't expect an announcement to be made before the second half of the year.

Several users polled by *Computerworld* said they expect Windows 2000 Server, which shipped in February 2000, to be supported for at least two more years.

"I just finished the migration to Windows 2000, and I do not want to be forced to upgrade again in the near future," said Susan McKay, vice president of customer and information systems at Aircast Inc. in Summit, N.J. She noted that her company used pay-per-incident support three times during its Windows 2000 migration.

Rick Waugh, a technology specialist at Telus Corp. in Burnaby, British Columbia, said his company would like support to extend beyond the next two years, since it made a multimillion-dollar investment in Windows 2000 and doesn't see a great benefit in rushing to Windows .Net Server.

Tom Bittman, an analyst at Stamford, Conn.-based Gartner Inc., said Microsoft won't "preannounce the death" of Windows 2000 Server before Windows .Net Server ships. But he expects .Net Server to ship in May and the life cycle announcement for Windows 2000 to closely follow. ◗

Windows NT Server 4.0 Retirement Cycle

SUPPORT

Jan. 1, 2003: Customers requesting nonsecurity Quick Fix Engineering (QFE), or hot fixes, will be charged a fee.

Jan. 1, 2004: Pay-per-incident and premier support, as well as nonsecurity QFE, will no longer be available.

PRODUCT AVAILABILITY

Oct. 1, 2001: Volume licensing is no longer available for Standard and Enterprise editions.

July 1, 2002: Full-package product (for Standard and Enterprise editions) will no longer be available in the reseller channel. Standard, Enterprise and Terminal Server editions will no longer be offered through the reseller channel.

July 1, 2003: Standard Edition will no longer be offered through the System Builder channel.

SOURCE: MICROSOFT CORP.

New Tools Watch Network App Performance

BMC, Mercury release products

BY MICHAEL MEEHAN

In response to calls for help from IT managers who are trying to prevent network gridlock, vendors of management tools are rolling out software that can monitor application performance across networks and on individual systems.

Houston-based BMC Software Inc. last week added increased network performance reporting capabilities to its application monitoring tools. And Sunnyvale, Calif.-based Mercury Interactive Corp. today plans to release a tool designed to let users quickly identify where applications are gumming up their networks.

Some beta testers have immediately placed the products in mission-critical environments. For example, the National Rural Telecommunications Cooperative (NRTC) in Herndon, Va., last month installed BMC's Application-Centric Network Management technology in an effort to curb a steady stream of bottlenecks.

ITMANAGEMENT

NRTC, which provides satellite TV, Internet and long-distance services to more than 1,000 rural utilities, upgraded its enterprise resource planning system to Oracle Corp.'s E-Business Suite 11i in July. While the new applications were more sophisticated than Oracle's older ones, they also proved hungrier for network and system resources, said Joe King, the NRTC's director of systems services.

"A lot of times, you couldn't determine whether it was the application or database that was the problem on a given server," King said. IT staffers would often hunt through servers to find what turned out to be network problems.

Those issues have eased since the NRTC began using BMC's tools, King said, but it's too soon to be able to quantify how much time and effort his workers are saving because of the software.

Most IT managers "have no concept what resources a given application is using," said Jean-Pierre Garbani, an analyst at Giga Information Group Inc. in Cambridge, Mass. He said BMC's new application management features give it an edge over rivals such as Computer Associates International Inc., Hewlett-Packard Co. and IBM's Tivoli Systems Inc.

At PHH Arval, a Hunt Valley, Md.-based subsidiary of Cendant Corp. that offers truck leasing and fleet management services, the classic response when an application created a logjam was to blame it on the network, said CIO Tim Talbot.

Talbot said the problem goes beyond load testing and into figuring out how applications behave on a network. PHH Arval, a user of Mercury's tools since 1997, has already installed the vendor's new troubleshooting module, which performs root-cause analysis of how applications run into trouble.

Talbot said quicker troubleshooting will give his staff more time to work on strategic IT projects. But the key point is improving the experience of end users, he added. "If they think [performance] is slow, it's slow," he said. "You have to figure out what's slowing that application down." ◗

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BRIEFS

Bank Plugs Web Site Security Hole

FleetBoston Financial Corp.'s credit card division in Horsham, Pa., said it fixed a security hole that could have potentially exposed hundreds of thousands of customer records to users of its Web site. The site was shut down for six hours while repairs were made. Fleet said the only person known to have exploited the hole was the customer who reported it to the bank.

Oracle Hit by Sales; Profit Declines in Q2

After what Chairman and CEO Larry Ellison called its "toughest quarter in a decade," Oracle Corp. reported a drop in both revenue and profits for its second quarter ended Nov. 30. Revenue came in at $2.4 billion, down 11% from $2.7 billion in the year-earlier quarter. Net income fell by 12%, from $622.8 million to $549.5 million. Oracle forecast a small year-to-year revenue decline during the current quarter.

Microsoft C# Ratified By Standards Group

The European Computer Manufacturers Association, a Geneva-based standards organization whose 30 voting members include many major IT vendors, ratified Microsoft Corp.'s C# development language and Common Language Infrastructure runtime environment as standards. Microsoft rivals Sun Microsystems Inc. and Apple Computer Inc. abstained from voting.

Short Takes

Provo, Utah-based NOVELL INC. released an upgrade of its directory software and said a version with Web-based and wireless management features is due in April. . . . New York-based e-business consulting firm RAZORFISH INC. said its European units are being sold to their management teams.

Sept. 11 Attacks Prompt Decentralization Moves

Users try to minimize disasters' impact on IT

BY JAIKUMAR VIJAYAN

THE SEPT. 11 terrorist attacks have some companies looking to spread out their IT workers, operations and systems much more widely than they do now, a reversal of the recent trend toward centralization.

The goal is to minimize the consequences of a catastrophic event at one location while ensuring uninterrupted systems availability.

For example, Empire Blue Cross Blue Shield, New York's largest health insurer, had its headquarters in one of the World Trade Center towers. Despite the destruction of the facility, most of Empire's services went uninterrupted because of the money and effort the insurer had put into building a fully redundant IT architecture designed to guarantee continuous uptime, regardless of catastrophes.

"The WTC incident fully justified the effort we had been putting into it for the past few years," said David Snow Jr., Empire's president and chief operating officer.

New Strategy

But the company's scramble to find alternative accommodations for its 1,900 displaced World Trade Center employees — combined with the enormous task of reconfiguring and hooking desktop systems into the Empire network — has Snow rethinking some aspects of disaster planning.

"Part of the [new strategy] is to not have all of our people in one building," he said. "It is a much less difficult chore when you have to deal with smaller units rather than big ones."

Empire is currently building a new headquarters in midtown Manhattan that's scheduled to open in 18 months. But not all of the displaced workers will move there. Instead, Empire will spread them across three facilities. Providing the needed recovery capabilities for such smaller units is easier than trying to do it with a 480,000-square-foot facility like Empire's World Trade Center offices, Snow said.

"More and more, we are getting away from a centralized model to a decentralized enterprise" characterized by smaller units linked to one another in a variety of ways, including wireless and voice over IP, he said.

The New York Board of Trade (NYBOT) is taking a similar approach. Despite losing financial records and some Windows-based applications that hadn't been backed up, the parent company for the Coffee, Sugar and Cocoa Exchange and the New York Cotton Exchange was able to restore many crucial services by the Monday after the destruction of its World Trade Center headquarters. The NYBOT was able to recover quickly mainly because it had the foresight to invest in a hot site in Queens, N.Y., paying $300,000 annually to maintain the facility.

More than three months after the attacks, the hot site continues to serve as NYBOT's temporary headquarters and is being expanded to hold six trading pits.

As it builds permanent facilities, one of the board of trade's goals is to separate its data center from the trading floor, said NYBOT President Mark Fitchel. The board is considering a triangulated architecture, with a trading floor, primary data center and backup systems in different locations that are linked in a fault-tolerant configuration, Fitchel said.

Even companies that don't need the kind of continuous uptime required by financial services and other data-dependent firms are spreading out their assets and information in the aftermath of Sept. 11.

Harris Beach & Wilcox LLP, which was on the 85th floor of World Trade Center Tower 2, lost all of its paper files, case folders, e-mail and computer hardware in the disaster.

Now the law firm is looking at going paperless. All paper documents that come into the office will be scanned and stored both on-site and at other locations around the U.S., said Alan Winchester, a technology partner at the firm. The firm will also replicate and store core information, such as financial data, at offices in New York and Rochester, N.Y.

Harris Beach is also building more redundancy into its communications network. Wireless and satellite communications will augment land lines in the future, Winchester said.

Indeed, many companies whose New York offices were destroyed are considering relocating to multiple smaller facilities and trying to use generic, replaceable technology where possible, said Larry Tabb, an analyst at Needham, Mass.-based TowerGroup. ▸

Looking Beyond IT for Redundancy

The events of Sept. 11 are forcing companies to think beyond information system uptime when it comes to disaster recovery and business continuity planning.

Take, for example, law firm Harris Beach & Wilcox, which had offices in the World Trade Center. As it rebuilds its New York infrastructure, the firm is looking beyond IT system redundancy in its disaster planning.

After scrambling to find new office space for its displaced staff, Harris Beach is considering establishing mutual aid agreements, under which one company would agree to help another with temporary facilities and equipment in the event of a disaster, said Alan Winchester, a technology partner at the firm.

Harris Beach is also instituting new guidelines for employees for staying in touch during emergencies. Among them is a recommendation for staffers to meet at an agreed-upon location the day after a disaster.

Mark Fitchel, president of the NYBOT, is working to ensure that its hot sites are better equipped to handle any future emergencies the magnitude of Sept. 11.

Its current hot site in Queens, N.Y., helped the board quickly recover whatever services it lost in the World Trade Center attacks. But with just two trading pits and no room for brokers to operate, the NYBOT has had to feverishly expand its facilities during the past few months. The lack of space has meant that brokers have had to stand outside the facility when they aren't trading.

"We should have understood that we needed that space for our members," said Fitchel, who estimates that the expanded hot site will now cost the NYBOT $1 million annually to maintain. "When people ask me about disaster planning, I tell them to count the number of people they have and make sure you have enough bathrooms. When you have a thousand people in a building, it can be a bit of a scramble."

– Jaikumar Vijayan

AT A GLANCE

Backup Plans

The National Infrastructure Protection Center in Washington says new approaches are needed for disaster recovery and business continuity.

The basic principles of emergency readiness can continue to be the basis for addressing new challenges, but the following must also be considered:

- The scope of disaster recovery planning must be broadened beyond its traditional focus on primarily operational issues to include backup security measures.
- Business continuity and disaster recovery planning needs to be an enterprisewide requirement.

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Court Order Shuts Down Dept. of Interior Web Sites

Lack of security cited as reason for taking agency off-line

BY JENNIFER DISABATINO

DATA IN SYSTEMS at the U.S. Department of the Interior (DOI) went from being exposed online to being completely cut off from the Internet in a matter of days, as the result of a U.S. District Court order.

Most government agencies have gotten poor grades on their Internet security, which a former DOI CIO said was almost nonexistent at his agency.

In September 2000, a House of Representatives subcommittee gave the DOI and several other agencies a failing grade on security. No agency received better than a "C." But the DOI is the only agency that has been forced off-line.

The DOI was singled out for its poor security because it was in violation of an order issued two years ago by the U.S. District Court for the District of Columbia that required the agency to do a better job of managing the accounts in the Individual Indian Monies Trust.

Judge Royce C. Lamberth, ruling on a class-action lawsuit against the department in 1999, found that there was almost no accounting of the funds the government was supposed to pay and hold in trust in exchange for the use of Indian tribal lands.

Now the plaintiffs, led by Eloise Cobell of the Blackfeet tribe, have obtained a temporary restraining order that keeps trust data shut off from the Internet.

Wide-Reaching Effects

Lamberth ruled Dec. 5 that the DOI must "immediately disconnect from the Internet all computers within the control of the Department of the Interior, its employees and contractors that have access to [Individual Indian Monies Trust] data."

In response, the DOI shut down its entire Web presence, including external e-mail.

"We're trying to utilize fax systems in the interim," DOI spokesman Mark Pfeifle said. He couldn't say how many subordinate agencies were directly connected to the Individual Indian Monies Trust, if any, nor could he say when the DOI would resume full access to the Internet.

"Our ability to conduct a large portion of our daily business has been impacted," said Deputy Secretary of the Interior J. Steven Griles.

By late last week, the agency had been able to put only a few pages from its primary site back on the Internet, and all of its subordinate agencies, except for the U.S. Geological Survey (USGS), remained off-line. The USGS was the only agency within the DOI to go back online early in the week, because it runs critical alert systems for natural disasters and terrorist-related activities over the Internet, according to DOI statements.

Lamberth's ruling came as the result of an investigation by Special Master Alan L. Balaran, who was appointed by the court to investigate security on the DOI's systems. According to court documents, he found that access to most of the DOI's network resources "is protected only by user IDs and passwords. No other access control mechanisms, such as firewalls, VPNs or strong authentication, are implemented."

Forced Closures

The following DOI agencies remained off-line at the end of last week:

- **Bureau of Indian Affairs**
- **Bureau of Land Management**
- **Bureau of Reclamation**
- **Fish and Wildlife Service**
- **Minerals Management Service**
- **National Park Service**
- **Office of Surface Mining**

Balaran hired Predictive Systems Inc. in New York to hack the system, which it did successfully. Now Predictive is working with the DOI's IT staff to improve security and demonstrate to Lamberth that the trust data is protected.

The special master's report also cites Dominic Nessi, who served as the DOI's CIO during the Clinton administration, as saying, "For all practical purposes, we have no security, we have no infrastructure. . . . Our entire network has no firewalls on it. I don't like running a network that can be breached by a high school kid."

The federal agency had already begun to address its security problem before the restraining order and had commissioned a report by Electronic Data Systems Corp. in Plano, Texas, to assess the problem.

According to that report, the agency had begun to modify its systems, but even the new architecture "is not complete, in that it lacks significant amounts of detail and contains gaps throughout." ▶

Fed Adoption of Encryption Standard May Spread Slowly

AES technology for private sector lags

BY JAIKUMAR VIJAYAN

The federal government's recent decision to adopt the Advanced Encryption Standard (AES) for securing sensitive information will trigger a move from the current, aging Data Encryption Standard (DES) in the private sector, users and analysts said.

But don't expect it to happen overnight, they added. Technology standards bodies representing industries such as financial services and banking need to approve AES as well, and that will take time. And products such as wireless devices and virtual private networks that incorporate AES have yet to be developed. Corporations using Triple DES technologies, which offer much stronger forms of encryption than DES, will have to wait until low-cost AES implementations become available before a migration to the new standard makes sense from a price perspective.

"AES will likely not replace more than 30% of DES operations before 2004," said John Pescatore, an analyst at Stamford, Conn.-based Gartner Inc.

Secretary of Commerce Don Evans announced the approval of AES as the new Federal Information Processing Standard on Dec 4. The formal approval makes it compulsory for all U.S government agencies to use AES for encrypting information starting May 26.

AES is a 128-bit encryption algorithm based on a mathematical formula called Rijndael (pronounced "rhine doll") that was developed by cryptographers Joan Daemen at Proton World International and Vincent Rijmen at Katholieke Universiteit Leuven, both in Belgium.

Experts claim that the algorithm is small, fast and very hard to crack — it would take 149 trillion years to crack a single 128-bit AES key using today's computers.

AES offers a more secure standard than the 56-bit DES algorithm, which was developed in the 1970s and has already been cracked. AES is considered even better than Triple DES, which is compatible with DES but uses a 112-bit encryption algorithm that's considered unbreakable using today's techniques. In software, AES runs about six times as fast as Triple DES and is less CPU-intensive.

AT A GLANCE

AES at Last

- The federal government's adoption of AES marked the culmination of a four-year selection process.
- AES is based on a mathematical formula developed by two Belgian cryptographers.
- A standard AES encryption key contains 128 bits; a DES key has 56 bits.

The advantages of AES make it inevitable that private corporations will start using it for encryption, said Paul Lamb, chief technology officer at Oil-Law Records Corp., a provider of regulatory and legal information to oil and natural gas companies in Oklahoma City. Corporations will adopt AES "because of the perceived problems with DES and the greater sense of security with AES," he said.

"I would expect the adoption curve to be pretty steep," said Steve Lindstrom, an analyst at Framingham, Mass.-based Hurwitz Group Inc. Any concerns corporations had about AES not being widely adopted have been put to rest with the government's decision to adopt it for all encryption going forward, he added. ▶

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BRIEFS

IBM Wins 10-Year Outsourcing Deals

Montreal-based National Bank of Canada signed a 10-year extension of an IT outsourcing deal with IBM's Canadian unit and said the new contract is valued at more than $700 million.

IBM also announced a 10-year outsourcing agreement with Royal & SunAlliance Insurance Group PLC's U.K. subsidiary, which said it hopes to reduce its annual IT spending by 10% through the deal.

U.S. Education Dept., Accenture in IT Deals

The U.S. Department of Education signed a pair of IT services contracts with Accenture Ltd. that base payments to the Hamilton, Bermuda-based consulting firm on expected savings and other performance measurements. Under the deals, Accenture and its subcontractors will forgo upfront fees in return for potential payments of up to $234.6 million over five years.

Lucent Widens Loss Forecast for Quarter

Lucent Technologies Inc. warned that the loss in its first quarter ending Dec. 31 will likely be much larger than expected because of a shortfall in sales. But the Murray Hill, N.J.-based telecommunications equipment maker said it expects revenue to start increasing on a sequential basis next quarter and predicted a return to profitability during its current fiscal year.

Short Takes

Waltham, Mass.-based **GUARDENT INC.** announced a managed security service based on a combination of proprietary and open-source technologies. . . . Security analysts warned that attackers could get full access to some Unix servers because of a security hole in the operating system's log-in program.

Banks Push IT to Help Link Customer Data

But conference attendees point to lack of standards for integrating systems

BY LUCAS MEARIAN
ANAHEIM, CALIF.

INFORMATION technology leaders and executives at the Bank Administration Institute's Retail Delivery Conference last week here vowed that 2002 will be the year of the customer, saying that technology should no longer be deployed for its own sake but only when it can enhance existing services.

But therein lies one of the biggest challenges the banking industry faces. Many conference attendees expressed concern over the lack of standards to tie together disparate, back-end database systems, with some placing their hopes on more consistent metadata through XML and other emerging protocols.

"The biggest challenge for this industry is the lack of technology that will allow us to leverage the technology we already have," said J. Randolph Bryan, senior vice president of delivery channel management at Hibernia National Bank in New Orleans.

Long-Term Opportunity

Conference keynote speaker David Coulter, vice chairman of New York-based J.P. Morgan Chase & Co., told more than a thousand attendees that customer satisfaction must be seen as a business strategy and that the long-term opportunity for banks is to drive down costs around the transaction hub and pass the savings back to the consumer.

Internet-based technologies "absolutely fit into the new model of retail banking, but it must be engineered carefully and deliver value to the customer consistently and with up-to-date information," Coulter said. "Some call this customer relationship management, but I'm cautious about that terminology because too many see CRM as a technology strategy," he said. "Small incremental change by the finance engineers to make a little better use of the technology we have will pay enormous dividends in the years ahead."

Banks could use some bottom-line help. According to New York-based First Manhattan Consulting Group, which released the results of a banking study at the conference, bank core deposits will continue to dominate the retail venue and profits over the next three to five years, with the nation's top 30 banks growing profits by just 1% per year.

> "The biggest challenge . . . is the lack of technology [to] allow us to leverage the technology we already have.
>
> **J. RANDOLPH BRYAN, HIBERNIA NATIONAL BANK**

Others say a well-trained sales force that can use data mining tools to determine customer needs will be key to growth in the next few years.

Joe Guyaux, executive vice president and CEO of regional community banking at PNC Bank in Pittsburgh, said, "The PNC sales force has been trained to take what the customer tells them and combine that with what they know" through back-end systems.

Like small banks, large institutions need to better utilize customer information to personalize "the whole [customer] experience," said Richard Hartnack, vice chairman of Union Bank of California. The problem many big banks face is that they have silos of customer information at different business units that they are struggling to link together through the use of middleware systems, due to a lack of standards, according to Hartnack and other executives.

Guyaux also espoused the benefits of using technology to integrate customer channels so that transactions can be monitored. That way, whether a consumer contacts the bank via its Web site, a branch location or the telephone help center, "we know when that transaction occurred," he said. ◗

FleetBoston to Web-Enable ATMs, Revamp Technology

ANAHEIM, CALIF.

Playing off the banking industry's customer-centric mantra, FleetBoston Financial Corp. announced last week that it plans to Web-enable its automated teller machines (ATM) in order to extend the reach of existing online services to its customers.

The project, which Fleet expects to cost tens of millions of dollars, is in line with what other executives at the Bank Administration Institute's Retail Delivery conference here say is necessary to grow in the future: using technology to integrate existing services.

ATMs are Fleet's highest touch point, accounting for 25 million transactions per month. Meanwhile, the Boston-based bank's online banking site, HomeLink, has grown to more than 2 million registered users.

Nandita Bakhshi, vice president and director of Fleet's self-service and ATM banking division, said that through many acquisitions over the past decade, "we've gained a network that's very disparate, made up of all types of ATMs of varying ages. The new architecture will provide a simple experience for our customers regardless of the type of ATM."

San Francisco-based Wells Fargo & Co. and Charlotte, N.C.-based Bank of America Corp. are piloting similar programs.

Fleet's Web-enabled ATMs will let customers access and print 30-day account statements, review investment account information from Fleet's Quick & Reilly investment subsidiary in New York and pay credit card and utility bills.

Fleet's ATMs, developed by NCR Corp. and North Canton, Ohio-based Diebold Inc., currently run on two distinct software platforms. To tie the two legacy systems together to share customer information in real time, the bank is using an open platform called Aptra, developed by Dayton, Ohio-based NCR. Bank customers will interface with HTML screens, using touchpads and screens. The bank will also move the systems off its mainframe architecture and onto its Windows NT Web servers, an architecture that it says is robust enough to handle the upgrade.

Bakhshi said Fleet will be able to connect ATMs to back-end systems through dedicated IP virtual private networks. The bank plans to pilot the system on 200 machines in New York and Boston in the first half of next year. It currently has more than 4,000 ATM machines on the East Coast.

Fleet's effort to Web-enable its ATMs is expected to eventually pay for itself, Bakhshi said, because the bank will no longer have to develop separate services for different platforms and "will now be able to leverage developments on our HomeLink site and partition it over to the ATM side."

– Lucas Mearian

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Content Caching Providers Roll Out Continuity Services

New security and traffic management capabilities aimed at preventing outages

BY JAMES COPE

AMTRAK got on board the content delivery network (CDN) services train when the technology proved itself after the Sept. 11 tragedy. With new CDN options available, vendors are hoping it won't take another disaster for companies to see the benefits of the services despite their high cost.

Akamai Technologies Inc., for example, last week announced the availability of several network security and business protection services for its EdgeSuite CDN service. San Francisco-based Digital Island Inc., now owned by London-based Cable and Wireless PLC, has also rolled out a service, called Intelligent Traffic Management (ITM), that gives corporate subscribers automatic fail-over to another data center should the primary server location go down.

Even without the new bells and whistles, CDNs can mitigate the effects of catastrophic events, said Lenetta McCampbell, director of Internet sales at Amtrak in Washington.

"Following the terrorist attacks in September, our Internet reservations system was running at 100% utilization," making it nearly impossible for marooned air travelers to log on, McCampbell said. Knowing Amtrak's plight, Akamai offered "to cache our content on their CDN free of charge until we resolved our availability issues," she said.

Officials at Akamai, in Cambridge, Mass., said the company has 13,000 servers worldwide on which it duplicates and stores information from clients' servers, making Web-based content more widely available and faster to access because the data is closer to end users.

WHEN AMTRAK'S Internet reservations system maxed out after Sept. 11, Akamai cached Amtrak's content, cutting server utilization by 50%.

Within three days of McCampbell's phone conversation with Akamai, Amtrak's content was out on the CDN, and Amtrak's server-use rates dropped to 50%. The passenger railway has since become a paying customer, McCampbell said.

One of Akamai's new services, Site Shield, puts its servers between the origin server and users on the Internet, effectively blocking routing between would-be hackers and the point of origin. Another new service from Akamai, Enhanced DNS, distributes name resolution across multiple networks using Akamai's infrastructure.

Digital Island's ITM service lets customers set policies on how traffic is routed, said Satyen Kothari, co-founder and CEO of Trapezo Inc., a San Francisco-based company that aggregates promotion and sales information for distribution through multiple channels via the Web.

Kothari said he doesn't have to subscribe to Digital Island's content delivery service to use ITM. The traffic management service costs Trapezo a flat fee of $5,000 per month, he said.

Each of Akamai's new services, by contrast, costs $5,000 to $18,000 per month, and Akamai requires subscribers like Limited Technology Services Inc., the IT arm of Columbus, Ohio-based The Limited Inc., to use its $20,000-per-month CDN service as well.

But Tim Plzak, Limited's director of advanced technology, said he believes the extra cost is worth it, especially for Akamai's new fail-over service. "The service has functioned flawlessly," Plzak said. ◗

Continued from page 1

Oracle

For example, David Brown, an enterprise integration and emerging technology architect at Vector SCM, said the Novi, Mich.-based company won't see cost benefits under the new pricing model until IBM rolls out models of its RS/6000 Unix servers that can run the Oracle8i database on a smaller number of processors.

"For the immediate term, the new pricing is more expensive than the pricing we received just last year [with the UPU approach]," Brown said. He declined to disclose specific details about the license fees paid by Vector SCM. The company, which is a joint venture between General Motors Corp. and Palo Alto, Calif.-based CNF Inc., manages GM's supply chain logistics operations.

"I think for someone that has a machine with high-powered CPUs, the [new] pricing model is OK," said the manager of new technologies at a manufacturer that's based in New England. "For those with lower performance, it's not."

But the user, who asked not to be identified, added that Oracle deserves credit for responding to the criticisms of the UPU-based pricing. "I'm hesitant to defend [Oracle], but you can't have it both ways," he said. "They've done what they can given what the concerns of the market were."

In an informal poll on *Computerworld*'s Web site last week, 32% of the 900-plus respondents said they're not satisfied with Oracle's new pricing scheme. That compared with 25% who indicated they're happy with the current per-processor approach. The other respondents said they don't use Oracle's databases.

The UPU methodology, which based prices on the number of processors in a server and the speed of the devices, was criticized as exorbitant by many Oracle users after it was implemented in mid-2000. Oracle did away with that approach in June and replaced it with a flat per-processor fee (see chart).

Jacqueline Woods, vice president of global practices at Oracle, said the change was meant to address the complaints and "minimize haggling" over license fees. Large users, in particular, stand to benefit from the new approach. But, Woods added, the vendor wanted to be neutral on hardware by charging the same per-processor price no matter what kind of CPU a customer uses.

Eastman Chemical Co., which in spring 2000 paid about $2.1 million for an Oracle license under UPU pricing, could have saved $800,000 if the current policy was in effect then, said George Miles, a senior systems associate at the Kingsport, Tenn.-based firm.

"The new processor-only pricing model would be cheaper for us, certainly, and I'm glad to see it," Miles said. "But even under the UPU model, we felt OK with the value." Eastman runs the database on an RS/6000 S80 server.

James Governor, an analyst at Illuminata Inc. in Nashua, N.H., said virtually all of Oracle's database rivals also use flat per-processor pricing. Oracle's current fee structure "is not unfair, really," he said.

But some users remain on the fence. Jim Prevo, CIO at Green Mountain Coffee Roasters Inc. in Waterbury, Vt., said he can't tell if Oracle's new pricing is better or worse than the old approach. However, he will find out when he upgrades his databases in the next couple of years. ◗

New Math

Oracle claims that its new database pricing can lower costs by as much as 60%, including volume discounts:

BEFORE Oracle charged license fees based on its Universal Power Unit measurement, which was calculated by multiplying the number of processors in a server by their clock speeds. The list price for each power unit was $100.

NOW The databases are priced on a flat per-processor basis, no matter how fast the devices are. The enterprise edition of Oracle's databases costs $40,000 per processor, while the standard edition is $15,000 for each CPU.

Quick Link

Oracle adds services aimed at helping users upgrade to its latest applications release:
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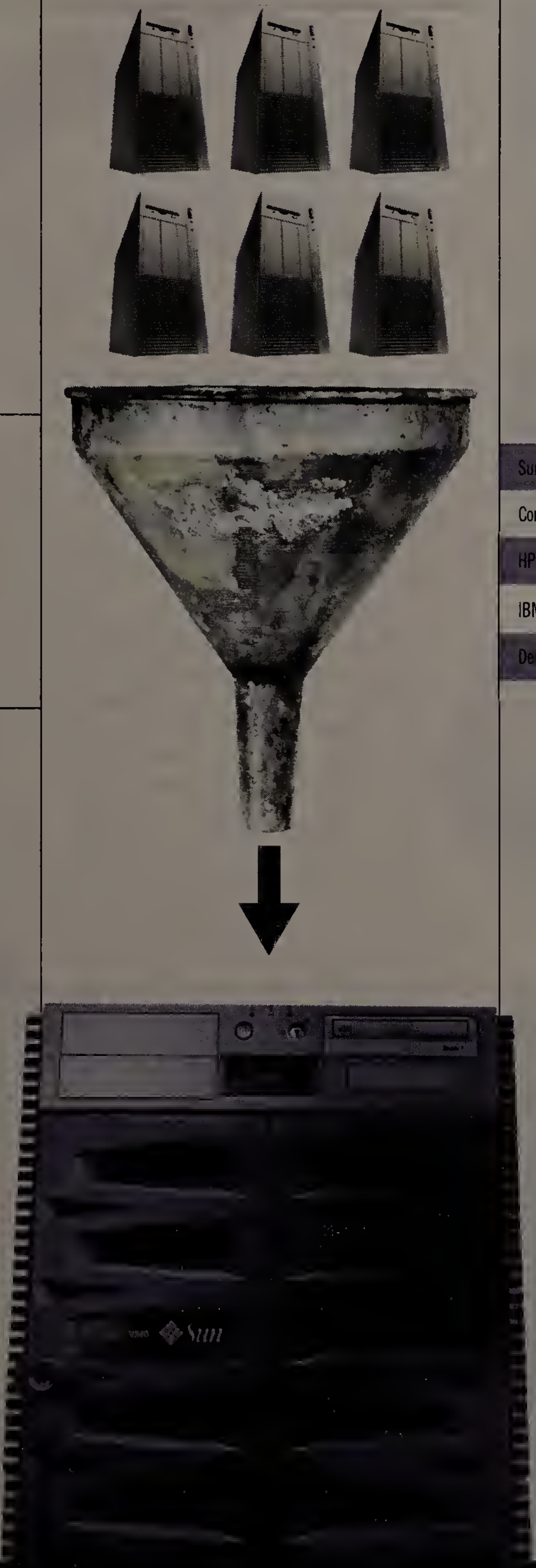

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	Operating Environment	2-way, 4GB memory, 6 disks/36GB	4-way, 8GB memory, 6 disks/36GB	8-way, 32GB memory, 12 disks/36GB
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Compaq ML750	NT	$45,307	$66,741	N/A
HP LXr8500	NT	$55,261	$75,471	$227,192
IBM x370	NT	$48,305	$61,635	$183,851
Dell 8450	NT	$37,260	$50,940	$162,987

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*Based on customer instances consolidating Windows NT servers using PC NetLink. **Based on comparable 2- to 8-way, 700MHz configurations as of 9/4/01 and 10/16/01 (Dell). Equivalent configurations of all Dell, HP and IBM servers include the cost of NAS storage; all competitive 8-way configurations include the cost of Windows Datacenter. ©2001 Sun Microsystems, Inc. All rights reserved. Sun, Sun Microsystems, the Sun logo, Sun Fire and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the United States and other countries. Products bearing SPARC trademarks are based on an architecture developed by Sun Microsystems, Inc. UNIX is a registered trademark in the United States and other countries, exclusively licensed through X/Open Company, Ltd.

NIPC Cautions IT Managers on Domain Server Setups

BY JAIKUMAR VIJAYAN

The U.S. government's cybersecurity agency is urging IT managers to ensure that their domain name servers are fully redundant and dispersed at multiple locations in order to avoid potential disruptions to services such as Web browsing, remote access and e-mail.

In the December issue of a monthly publication called "Highlights" that's posted on its Web site, the Washington-based National Infrastructure Protection Center (NIPC) said the Domain Name System (DNS) is an often-overlooked single point of failure "presenting a risk of total loss of electronic connectivity" for users.

Domain name servers are used to translate Internet domain names from plain text into numeric IP addresses that can be read by computers. The major risk factors associated with failures of such machines are a lack of built-in redundancy, misconfigured servers and architectural flaws in the way the systems are set up on networks, according to the NIPC, which is affiliated with the FBI.

For example, the agency said many companies depend on just one domain name server to handle all Internet connectivity requests from end users.

In addition, companies that have multiple DNS servers sometimes put them all on the same network segment, the NIPC said. That could make the servers simultaneously unavailable if something happened to the network segment.

Learning the Hard Way

Microsoft Corp. learned that lesson in January when a faulty configuration change on a router and a series of denial-of-service attacks cut off access to its DNS servers, which were all housed on one section of the company's network. Most Microsoft Web sites were unavailable for parts of several days.

A surprisingly large number of U.S. companies make such mistakes, the NIPC said, citing data from Men & Mice, a Reykjavik, Iceland-based research and consulting firm that specializes in DNS issues.

In a survey conducted in late September, Men & Mice discovered that as many as 250 of the Fortune 1,000 companies had all of their domain name servers on the same subnet, said Jon Adalsteinsson, the consulting firm's chairman.

"Companies have redundant Web servers and [round-the-clock] monitoring and on-call service, but they forget about the DNS servers that control access to all of this," he said. "If the DNS goes down, all of the other redundancy doesn't even come into play." ▸

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Oracle, Commerce One Join B2B Sourcing Battle

New e-commerce applications target users doing online searches for suppliers

BY MICHAEL MEEHAN

EVEN THOUGH there aren't as many passengers climbing on board these days, the business-to-business software bus keeps rolling forward as rival vendors try to match one another with online sourcing applications aimed at automating the process of finding suppliers.

Developing sourcing applications has become the rage for business-to-business vendors this year, and that trend continued last week when Oracle Corp. and Commerce One Inc. both announced new sourcing tools. Ariba Inc. rolled out sourcing software three months ago.

The new applications were designed so that users looking to buy products such as office supplies can post requests for proposals online and then score the responses they get from would-be suppliers.

Pierre Mitchell, an analyst at AMR Research Inc. in Boston, said automated sourcing is the logical next step for companies that have installed software supporting online purchasing and business-to-business auctions. But Mitchell added that he doesn't expect users to rely on the current sourcing tools for much beyond auctions and pilot projects involving the negotiation and management of long-term contracts.

For example, Commerce One built its new sourcing application based partly on recommendations submitted by General Motors Corp., which owns part of the Pleasanton, Calif.-based vendor. The Commerce One Source software is available for beta testing now and is due to ship later this month.

But a GM spokesman said the automaker isn't using the beta-test version of the sourcing tool at this point. GM did provide input to Commerce One on needed functionality, "but that's the extent of it," the spokesman said.

While Commerce One is among the entrenched business-to-business vendors, Oracle has been a relative latecomer to the market. But its Oracle Sourcing application puts the capstone on an e-business product offering that also includes procurement and spending analysis software.

Joseph Marino, an analyst at Current Analysis Inc. in Sterling, Va., said Oracle has chosen a good time to jump into the business-to-business market in a bigger way. Companies such as Commerce One and Sunnyvale, Calif.-based Ariba are in a state of flux because of a demand slowdown, he noted.

"This isn't a short race," Marino said. "It's a marathon, and Oracle's got an installed base [from its database and business applications] that will allow it to stick around."

The big challenge for Oracle will be proving that its applications work well in multivendor environments, Mitchell said. ◗

From the Source

Details of the new sourcing products being released by Commerce One and Oracle:

Key features: Multiattribute bidding with the ability to change scoring parameters; links to procurement, contract management and spending analysis software.

Pricing: Oracle will charge $5,000 for every $1 million in transaction volume, with a $100,000 minimum fee; Commerce One expects costs to average $500,000.

Hardware Vendors Set Blade Server Plans

BY LINDA ROSENCRANCE

Hewlett-Packard Co.'s announcement that it plans to ship a high-density blade server next month has prompted a flurry of similar moves.

Not to be outdone by HP, Compaq Computer Corp. and Sun Microsystems Inc. quickly detailed their own plans to release blade servers, which integrate processors, memory and I/O functions on a single circuit board.

The jockeying continued last week, when RLX Technologies Inc., a start-up in The Woodlands, Texas, announced a second-generation blade system and a control device for managing the compact servers.

In May, IBM agreed to resell RLX's devices, but none of the top-tier server vendors has shipped a blade developed in-house. Gordon Haff, an analyst at Illuminata Inc. in Nashua, N.H., said HP's announcement forced Compaq and Sun to make their strategies known.

The vendors are also adjusting their blade server technology plans as they turn more of their attention to corporate users, Haff said.

Blade servers can be densely stacked in racks. For example, RLX claims that it can fit 336 blades in a standard server rack. Because of that capability, vendors initially aimed the devices at Web hosting firms and other IT service providers that need to shoehorn a large number of servers into their data centers.

That's "not such a good market now" because many service providers are struggling financially, Haff said. But, he added, sales to corporate users won't take off until vendors offer better management and automation tools to support the devices.

Some vendors are trying to do just that. RLX said the control blade it released last week can be used to check the status of computing blades on a network and to install new software images on the devices or remotely reboot them.

Compaq said new remote management software will be a key add-on feature of its blade line, due out early next year.

Sun and HP also indicated that they're focusing on improving the manageability of blade servers for users. ◗

Sharpening Blades

Vendors developing blade server systems include the following:

HP: Plans to ship an initial blade server next month based on a low-voltage Pentium III Tualatin microprocessor from Intel.

Compaq: Will start volume shipments of Intel-based blade devices and optional management tools early next year.

Sun: Is looking to release blade systems during the second half of next year, potentially using its UltraSPARC chips.

BRIEFS

Xerox PARC Lab to Become Independent

Xerox Corp. announced plans to turn its Palo Alto Research Center (PARC) into an independent subsidiary that will hire its own CEO and look for other investors to help fund its technology research work. Employees at the California laboratory are due to be transferred to the new company as of Jan. 1, but Stamford, Conn.-based Xerox said it will maintain access to technology developed by PARC.

Palm Agrees to Buy Wireless Developer

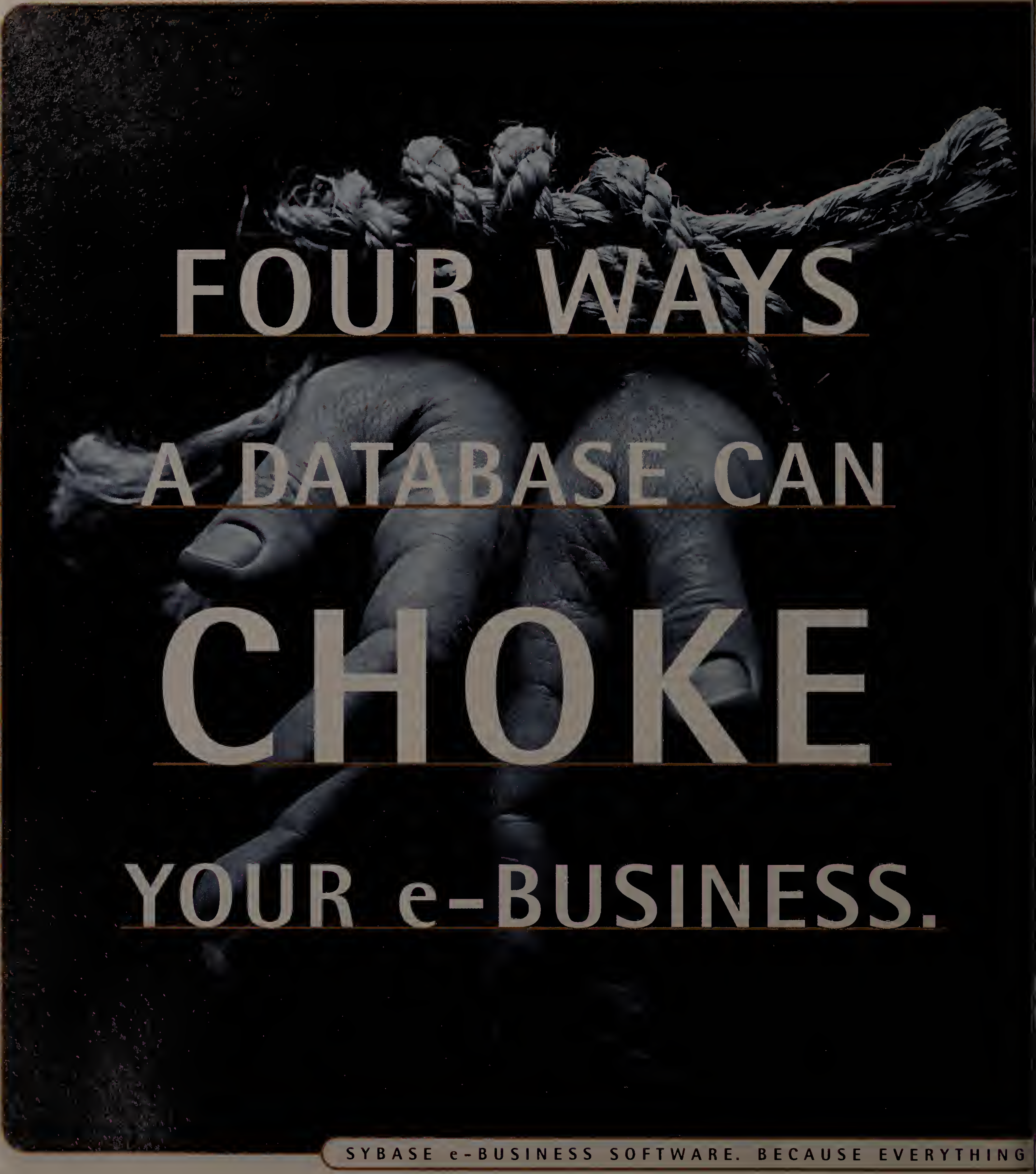
Handheld computer maker Palm Inc. signed a deal to buy ThinAirApps Inc., a New York-based developer of wireless groupware and data access applications. Santa Clara, Calif.-based Palm said the stock-swap purchase, valued at about $19 million, should be completed this month. The companies are already doing joint development work under an earlier deal.

Consulting Firms in Asset Buyout Deal

Lante Corp., a Chicago-based IT services firm, agreed to pay $3 million to buy most of the assets of Luminant Worldwide Corp., which filed for bankruptcy protection this month. If approved by a judge, the deal will include Dallas-based Luminant's e-business consulting contracts and intellectual property. Lante said it will also offer jobs to some Luminant workers.

Short Takes

Peabody, Mass.-based **SCANSOFT INC.** completed its purchase of Belgium-based **LERNOUT & HAUSPIE SPEECH PRODUCTS NV**'s core assets after a bankruptcy judge OK'd the deal. . . . Atlanta-based **INTERNET SECURITY SYSTEMS INC.** said Ken Walters is resigning from his position as chief operating officer.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Unlike the department store, the mall or warehouse, e-Business is by its very nature 24x7. Someone, somewhere right now, is shopping for something. Whether it's a shirt or a sales report.

This poses some interesting questions for everyone managing a database.

If your e-Business is constantly online, how do you handle routine DBMS chores like maintenance?

How do you add new components and resources without disrupting your current customer transactions?

Fortunately, Sybase ASE (Adaptive Server Enterprise) 12.5 answers these questions.

ASE lets you perform routine maintenance operations and even change configuration parameters while the database is online.

You can transfer users from your primary system to your backup system without missing a beat. Even if they're in the middle of a transaction. Your employees won't even know it's happening. And neither will your customers.

In case of emergency, ASE's cluster architecture provides fail-over to a backup server without losing any non-committed data or severing a single user connection.

Bottom line: ASE delivers continuous availability to everyone who needs it whenever and wherever they need it.

INSECURITIES BRING YOU DOWN.

The sad reality is an e-Business address is like a target painted on your back. The more data collected in your database server, the more paths of access to that server, the more tempting the target is to intruders.

ASE recognizes the challenge and responds appropriately. You'll find more security features than a Secret Service detail. Including, but not limited to: protection from wiretaps, accidental disclosure and prying from thieves and vandals.

Sybase ASE provides a row-level security mechanism that allows you to define how your database is accessed. It's a feature you'll find missing in most competitive products.

ASE also features link encryption using SSL and PKI certificates. While virtually invisible to users and developers, your users' entire interaction with the database is fully encrypted.

So your business is safe for business.

XML MEETS A DEAD-END.

This may seem too obvious to speak of, but still worth noting. Your database needs to play nicely with the many Web-driven technologies that make up today's e-Business language. Obviously this includes both Java and EJB.

But now more than ever it means XML, the emerging standard for encoding information for document interchange. If your database is not totally XML fluent, you're going to have a hard time doing B2B commerce on the Internet.

Sybase ASE makes XML rock in ways other databases simply don't. Sybase ASE has a complete XML framework for storing, managing and retrieving XML directly to and from the database.

Data stored in the database can be retrieved as XML allowing for easy integration of your existing information with your new Web applications.

A general XML-Query facility (XQL) allows you to easily query XML data whether it's stored in the DBMS, a flat file or even a URL. Bottom line: faster development times, faster access to the information you need.

HIDDEN COSTS BITE.

In a time when everyone is searching for new efficiencies, Sybase ASE delivers real value.

It reduces costs by the very nature of its 24x7 design. It ensures that your business never goes down. It delivers fast backup and recovery. It utilizes hardware resources efficiently. But even before you get to all of that it saves you time and money in the traditionally costly development process.

If e-Business is going to be a critical part of your success this year, ASE has a critical role to play.

To find out more about how Sybase ASE can help you quickly deploy and manage a successful e-Business, visit www.sybase.com/breathe or call 1-800-8-SYBASE. We'll make sure you get a database that won't choke your e-Business.

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PATRICIA KEEFE

Refocusing in 2002

THIS HAS BEEN A HELLISH YEAR. 2002 just can't get here fast enough. Looking back over 2001 is like stumbling through a house of horrors. It was a year of continuing drought in the East, raging fires in the West, anthrax and network-crashing plagues of computer viruses.

PATRICIA KEEFE is editorial director at *Computerworld*. You can contact her at patricia_keefe@computerworld.com.

Overshadowing everything are the Sept. 11 terrorist attacks, the ripple effects of which are still wreaking havoc across countless vertical industries. The dot-com bubble burst, splattering across the economy and triggering endless reports of layoffs, multimillion-dollar losses and company shutdowns, until we were finally forced into a recession. The pall cast by empty offices deepened as venture capital shrank. Remember that urgent request for more H-1B visas? Well, never mind! And the collision of e-commerce and personal rights left privacy battered and bruised on the side of the road.

The trickle-down effect has once mighty ships of the computer industry listing, some even sinking. The telecommunications sector tanked, led by the near collapse of Lucent and Nortel. B2B? Practically history, as Ariba, i2 and Commerce One floundered. Computer Associates' newly polished image was sullied by charges that it fixed prices in 1999, while layoffs struck it, Oracle, Sun, HP, Dell, SAP, Cisco, EMC and many others.

Users overall are facing ominous trends in upgrade policies, licensing costs and contractual terms, and some are struggling more closely with the fallout from Sept. 11 and vendor woes.

As we cautiously open the door to 2002, we might take as our rallying cry Cisco CEO John Chambers' recent vow to refocus on the basics: cash flow, profits and productivity. Never mind the unattainable goal of double-digit annual revenue growth rates or long-term strategies with amorphous payoffs. Investing in projects with tangible payoffs is the way to go for now.

IT can further contribute to bottom-line goals by scouring operations for inefficiencies. An examination of something as mundane as printing operations can uncover surprising waste and reveal sizable savings opportunities. But you have to know what you've got, and who's using it. So No. 1 on your to-do list for 2002 just might be a systemwide audit. Once you've got that covered, you can correct weaknesses and move more confidently to enable profits and assist productivity. ◗

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"I'M HOPING FOR PEACE ON EARTH AND UNDERSTANDING AMONG HUMANKIND, BUT I'D SETTLE FOR A REALLY COOL DIGITAL CAMERA."

PIMM FOX

Buy IT Now and Avoid the Rush

THE HOLIDAYS ARE a time for exuberance, so let's indulge. Both Intel and Advanced Micro Devices have announced stronger-than-expected chip sales, fueling speculation that we have passed the worst of the IT recession. And with talk that an economic rebound could come around the middle of next year, it's useful to see how that rebound will play out for IT.

PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

First, let's recall how we got into this mess.

It started when the B2C market collapsed. Dreams and dollars were wasted on efforts to turn all consumers into cybershoppers and fears that Old Economy companies would be replaced by Internet start-ups. That notion vaporized along with lots of venture capital.

Then the B2B sector was roiled when business managers acknowledged that transforming their supply chain relationships into electronic handshakes wasn't the smartest, or most profitable, idea.

Next to stumble was the general IT sector. Everyone seemed to have plenty of servers, bandwidth and applications to go around.

And, finally, the zenith of infrastructures — telecommunications and networking equipment — took it on the chin when customers failed to embrace the concept of "Build it and we will come."

The rebound *will* come, but in reverse order. And it will arrive with a wrinkle that's positive for IT users while depressing for IT workers, says Ravi Aron, assistant professor of operations and information management at the Wharton School of the University of Pennsylvania.

"Price pressures on hardware will continue," says Aron, "and companies will begin to spend at the higher end of the hardware spectrum."

Competitively priced telecom and networking equipment ought to be snapped up as companies increase capital equipment purchases and vendors clear out inventory.

"Companies don't need the latest and greatest," says Aron, "but they will take advantage of price reductions."

The B2B sector, which has matured to encompass legacy applications, will be boosted by in-

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tense focus on ROI. Software vendors that demonstrate tangible and measurable productivity and financial gains will be winners, but customers will remain concerned with what Aron describes as the operations hidden from the consumer. "Middleware and Web services, the stuff that allows you to stitch together a bunch of machines, are increasingly important," he says. "The game of building the intuitive, sexy front end is over."

But there remains a problem for IT professionals: Because hardware and software prices can be negotiated down, these investments will come first in the rebound. For people, though, there's a salary level below which they won't write code, develop an application or design an IT project, which means hiring comes last.

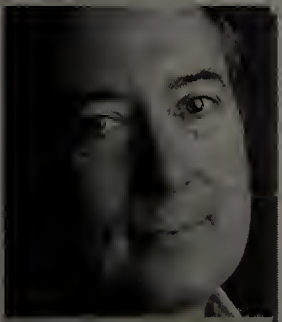
And that's why all exuberance is irrational. ◗

DAN GILLMOR

Has the Door Widened for Linux?

ON A RECENT TRIP to China, I noticed that many of the Intel-compatible PCs for sale in several major department stores had a slightly different appearance than usual, apart from the language differences. I looked closely and realized they were running GNU/Linux.

It was a sight you almost never see in the U.S., where Microsoft's Windows has a vise grip on non-Apple desktop and laptop computers. But some intriguing trends, not the least of which is Microsoft's insatiable appetite for domination, are hinting — just hinting — at something more.



DAN GILLMOR is technology columnist at the *San Jose Mercury News*. Contact him at dgillmor@sjmercury.com.

As *Computerworld* columnist Nicholas Petreley noted [Technology Opinion, Dec. 3], installing Linux on the server has become almost a no-brainer for many companies, especially those looking to replace higher-end Unix systems. Maybe it's still a stretch to imagine Linux as an alternative, much less a realistic competitor, to Windows on the desktop. But it's not as big a stretch anymore.

Several developments are contributing to that impression. The first is the Linux community's continuing efforts. Steady progress has made Linux a reliable operating system with enough drivers that run well on a variety of hardware, plus several good GUIs and other essential pieces.

Then there's the growing number of applications that run well on Linux. Two key pieces for enterprises are about to arrive. Sun's StarOffice 6, now in beta testing, is looking genuinely worthwhile despite some extremely rough edges. (I used the beta on a Linux machine to write the first version of this column. Imagine my irritation when the program crashed and, despite repeated saves, consigned all but two paragraphs to the ether.)

Another potentially important client development is the Microsoft Exchange connector that open-source vendor Ximian says it's about to release for its Evolution groupware package, which runs on Linux. (The connector will be proprietary.) Many would-be Linux users are obliged to run Outlook -- the greatest virus-propagation machine around today — to get access to their companies' Exchange servers.

Microsoft is contributing in typical fashion. It's raising prices in a souring economy, and IT buyers are getting increasingly restive at paying tribute. Microsoft exemplifies the victory of "good enough" in technology — and maybe StarOffice, Evolution and the like will be good enough, given how much less expensive they are. StarOffice 6, in particular, could be genuinely competitive with Microsoft Office if Sun finds a way to ensure that files created in one suite will run in the other.

Microsoft's move to Web services is part of its response to the open-source threat. It plainly hopes to use its .Net technologies to capture control of basic Internet functions the way it has monopolized the desktop. The open-source community, meanwhile, is working on its own renditions of Web services.

But the sellout of the public interest by the Justice Department and some of the states suing Microsoft is a danger. The loophole-ridden settlement, now before a federal judge, would give Microsoft all the room it needs to use its desktop monopoly, and the monopolylike profits it generates, to squash would-be competitors.

Meanwhile, IT organizations are looking for help in an economy that doesn't allow for much luxury. Microsoft's desire to squeeze money out of its customers is the kind of thing you'd expect.

Maybe customers should start doing the unexpected: finding solutions that work but don't cost so much. ◗

READERS' LETTERS

Strong Statements

AS REPORTED in your Nov. 26 issue ["New Oracle Center to Tackle Security, Homeland Defense," News], during the Comdex conference, Oracle CEO Larry Ellison stated that Oracle9i is unbreakable, challenged the hacker community to break into it and emphasized the 14 security certifications that Oracle has received from the federal government. Any of these three utterances could possibly be exonerated. Stating them all at a single event is simply egregious. Is Oracle9i unbreakable? Writing a single secure distributed Java applet is a challenge; writing an unbreakable database is a near impossibility. As for hacker challenges, they lack any sort of methodology and have been effective only as marketing ploys, never as a meaningful substantiation of security. Finally, government certifications, especially in the IT world, aren't worth much. The Airbus that crashed last month had scores of them. Navigating the often-difficult waters of security is tough enough. Comments like Ellison's serve only to make that water murkier.

Ben Rothke
Senior security analyst
Camelot Information Technologies
New York

The AIA Clarifies

CONTRARY to your Oct. 15 News article "Aerospace Group Backs New EDI-to-XML Bridge," the Aerospace Industries Association's Electronic Enterprise Working Group (EEWG) does not endorse or promote the use of any commercial products or services.

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Editor's note: *Our article did state that the AIA "plans next month to publish business-to-business collaboration specifications based on [Value Chain Markup Language] for use by its members." But the use of the word* backs *in the headline and language in an accompanying chart were indeed misleading. We regret the errors.*

Thanks, Techno-geek

THE ANALYSTS quoted in the story "Hacker Explains Recent Exploits Inside WorldCom Network," are being overly harsh [*Computerworld.com*, Dec. 7]. Pete Lindstrom is correct that all passwords and phone numbers for WorldCom routers should be changed; that would only be prudent and should happen periodically anyway. But a lawsuit would be inappropriate unless damage could be proved. Eric Hemmendinger equated the incident with someone poking around, finding an open door and entering your house. How about someone who finds a wallet filled with cash and private information? If he tries to identify the owner to return the wallet, is he a thief for handling private property? I want to thank Adrian Lamo for being a conscientious techno-geek and WorldCom for *not* turning him into a criminal, which would only discourage future conscientious behavior.

Bruce Seeloff
Software developer
Indianapolis

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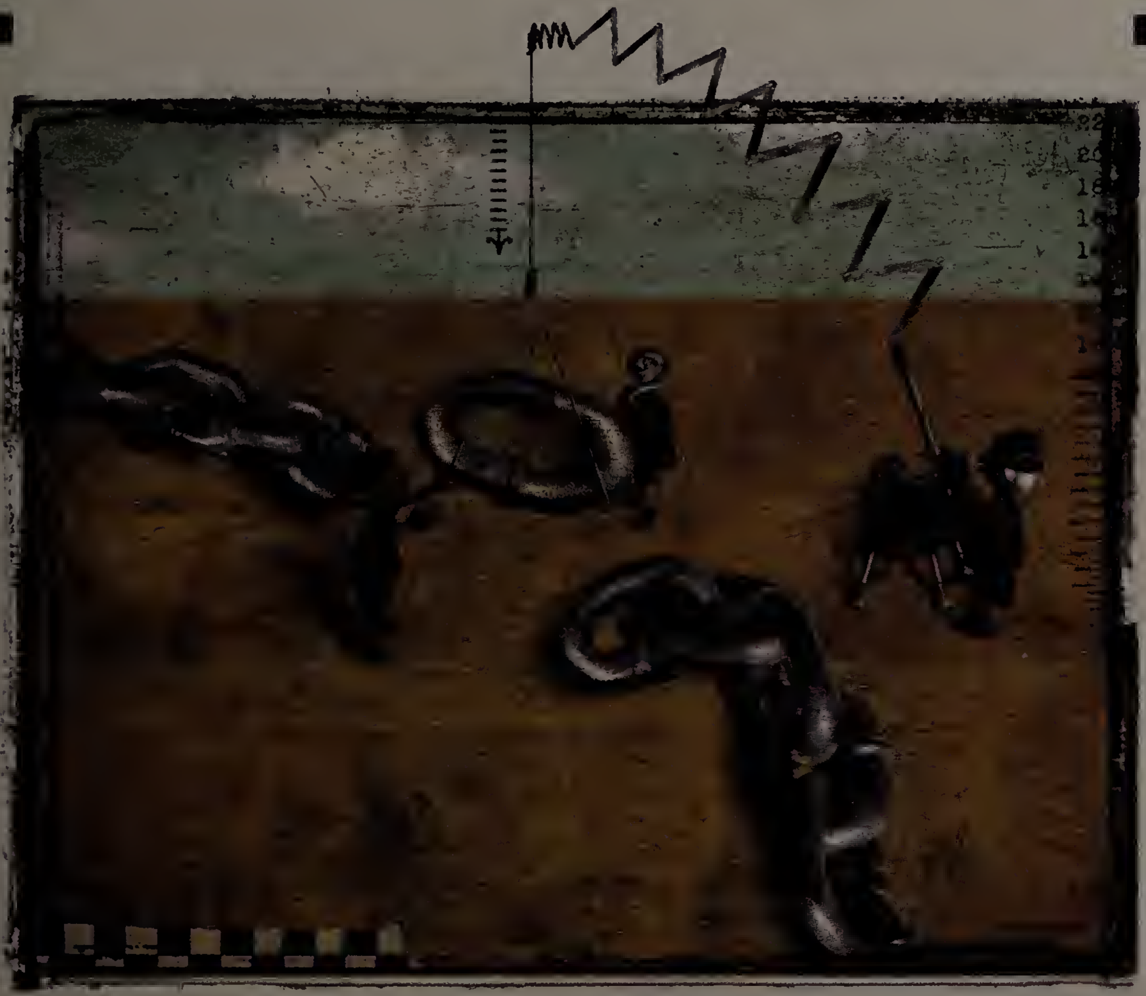

RICHARD BORGE

SPECIAL REPORT

Supply Chain

Missing Links

Supply chain projects are running into integration problems, dirty data and funding cutbacks. Yet they're more important than ever.

EDITOR'S NOTE

THE DRUMBEAT is like the thumping of a migraine. The manufacturing sector is in a recession. The supply chain market is in a recession, or at least the growth rate has plummeted. Vendors are dropping like flies or "repositioning."

Cheery, huh? Wait, there's more.

Supply chain projects are running afoul of departmental turf wars and scope creep. The return on investment is elusive. Cynicism is creeping in. Executives are yanking funding midproject so they can meet Wall Street expectations for quarterly earnings.

Integrating the thousands of fax-happy small businesses is no picnic, either. And then dirty data can ruin even a great piece of supply chain software.

So why don't we all just give up and get a root canal instead? Because bringing automation to the supply chain is too important, that's why.

For one thing, what better time than a recession to be wringing waste and inefficiency out of your relationships with trading partners?

For another, we've never before needed to know so much about our far-flung supply chains.

The ongoing war on terrorism means companies suddenly want to know where their goods are at any given moment. (Consultants call it "supply chain visibility.") That way, the goods can be rerouted around problem areas, and managers can account for the inevitable delays of our newly security-conscious world. But it requires robust information systems to give business managers the data they need for fast decisions.

As they say, everything has changed since Sept. 11 — even supply chain planning. Instead of a religious devotion to just-in-time inventory, the new world order requires flexibility and resilience.

Maybe you can be a hero and build a supply chain system that brings good news to the bottom line — and your career. ◗

Mitch Betts (mitch_betts@computerworld.com) is director of Computerworld's *Knowledge Centers.*

Knowledge Centers Online

Knowledge Centers are the place to go to find practical information about specific technologies and IT topics. In addition to this monthly Special Report in print, there are numerous resources at our Web site, such as research links, events, glossaries, white papers and the following online features:

- **How to manage the supply** of contract workers, and consultants, too.
- **Achieving cost savings** in the supply chain can be a career-booster.
- **Event management software** acts as a second set of eyes to spot problems.

Visit the Supply Chain Knowledge Center: www.computerworld.com/q?k2000

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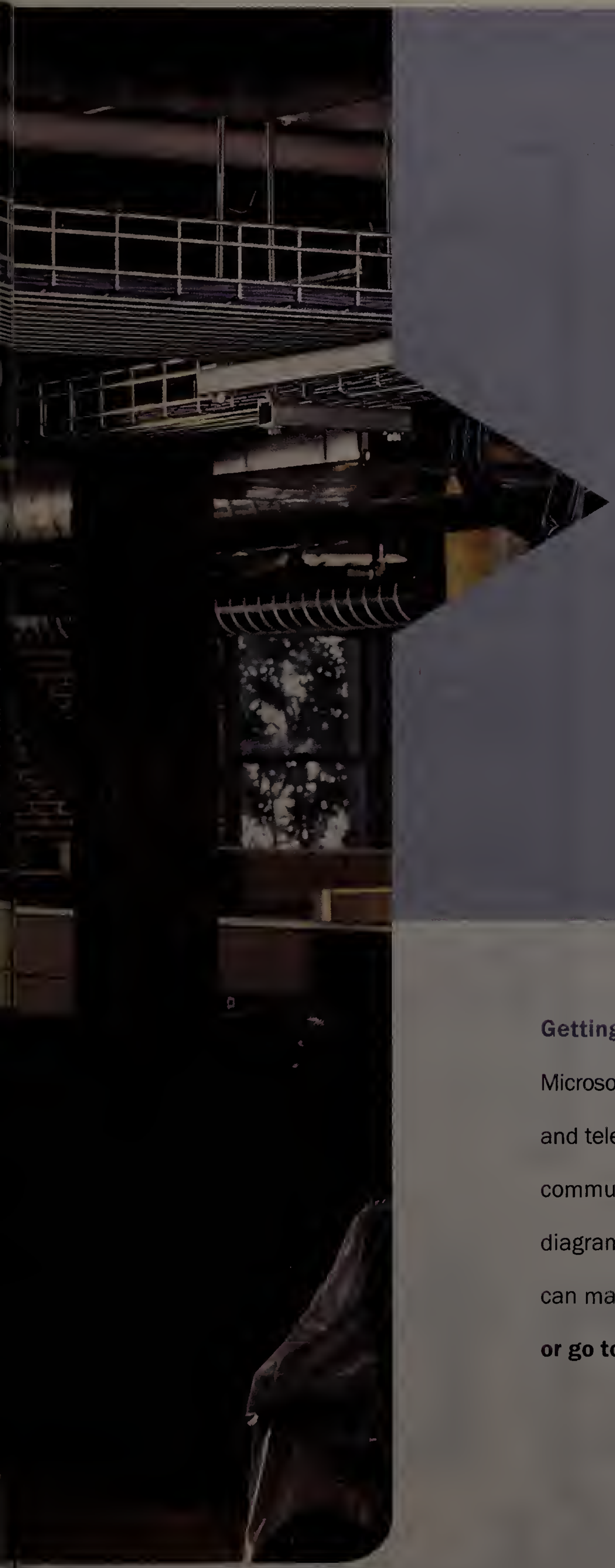
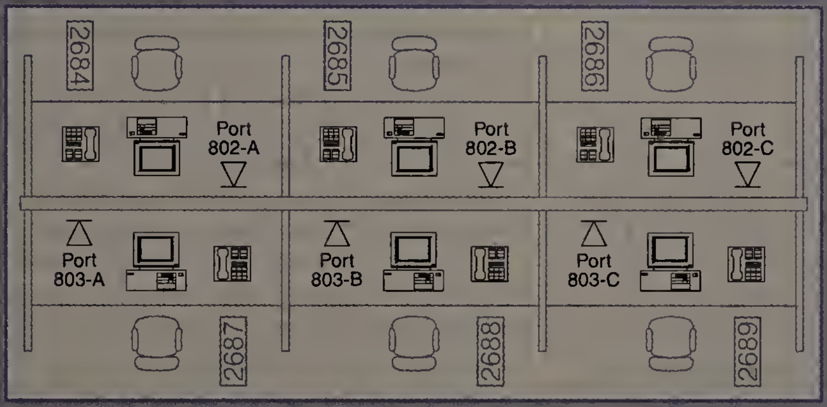


See what I'm saying?



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Patching the Supply Chain

In its second year, the Covisint exchange gets mixed reviews as it relies on third-party software to fill gaps.

By Lee Copeland

CASE STUDY

CRAFTING AN APPLICATION PLATFORM that can handle up to $300 billion in automaker business each year is a daunting idea. For Covisint LLC, the start-up tasked with mastering that challenge, so is the reality.

DaimlerChrysler AG, Ford Motor Co. and General Motors Corp. anted up a total of $200 million to found Covisint in February last year. The unprecedented joint effort aims to weave together back-end systems from the automakers and suppliers to create a Web-based exchange to automate the time-consuming and costly chore of acquiring direct materials, parts and sourcing contracts from suppliers.

The ambitious industry exchange looks great on paper. But going into its second year of operation, Covisint's progress is getting mixed reviews. The Southfield, Mich.-based start-up adeptly auctions service contracts, materials and parts today. It snared almost $100 billion in auctions from GM alone in 2001, but only a small percentage of that amount counts as revenue. And looking beyond online auctions and procurements, Covisint's role and progress get harder to measure.

To tackle other critical parts of the supply procurement process, such as inventory management, collaborative design and quality assurance, Covisint relies on several third-party vendors, such as SupplySolution Inc., MatrixOne Inc. and Powerway Inc.

That's a problem, say automotive analysts, because those stopgap technologies are key to Covisint's long-term viability and amount to a clear stumbling block to Covisint's long-stated aim to serve as a one-stop shop for the industry.

"Looking at their vision, there is a huge amount of potential. But other than potential, they are not having a huge impact on the industry yet," says Kevin Prouty, an analyst at Boston-based AMR Research Inc. "Covisint is still trying to build up its infrastructure and personnel, so how much opportunity can they grab?"

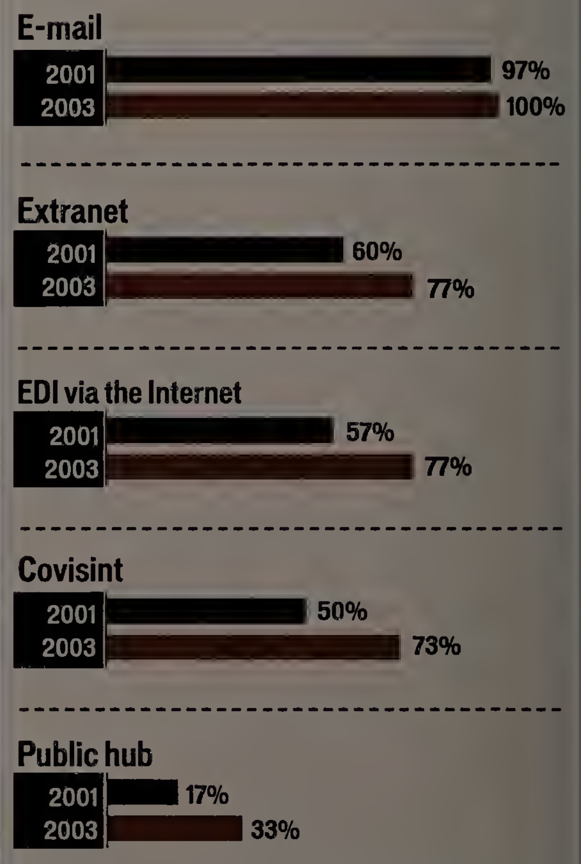
For starters, Covisint appears to be grabbing partners to offer technologies that it can't build on its own. For Web-enabled direct material fulfillment, which should reduce waste by communicating changes to supply and production schedules, Covisint tapped SupplySolution last March. Southfield-based SuppySolution had 1,000 automotive customers that predated its exclusive deal with Covisint. Under the terms of the deal, SupplySolution will continue to sell its I-Supply product to companies in other industries. But for automotive customers, those sales get channeled through Covisint, which has renamed the product Fulfillment.

To better manage advanced product quality planning, a process that addresses parts changes during the design and manufacturing process, Covisint struck a deal with Indianapolis-based Powerway last April at the urging of DaimlerChrysler. The automaker had already begun standardizing on Powerway's Web-based tool and document management services. It also holds an undisclosed equity stake in Powerway.

And in the area of collaborative product design and project management, Covisint brought in Westford, Mass.-based MatrixOne. That agreement essentially ends Covisint's partnership with NexPrise Inc., which was acquired by Mountain View, Calif.-based Ventro Corp. in August. After Covisint implements MatrixOne's set of Value Chain Portfolio products

Auto Suppliers' IT Plans

Automotive suppliers say they use, or plan to use, the following technologies to connect to automakers:



Base: 30 Tier 1 automotive suppliers in North America; multiple responses allowed.

SOURCE FORRESTER RESEARCH INC., CAMBRIDGE, MASS.

next year, support for NexPrise will be phased out.

But even though Covisint provides three vital parts of automotive supply chain management through three outsourcing arrangements, the exchange projects that 75% of its revenue will come from these types of technology products and accompanying services by 2005, compared with virtually no revenue in those areas this year, says Harold R. Kutner, group vice president of worldwide purchasing at GM and a member of Covisint's board of directors.

Kutner acknowledges that selecting technology from these three partners was Covisint's third choice. Its first choice would have been to go with its vested technology partners, Commerce One Inc. and Oracle Corp. It's second would have been to build the applications in-house.

"If I had my way, we would develop everything in-house, and we wouldn't share any revenue. But you have to be realistic," says Kutner. "It's an embryonic company of a couple hundred people. We don't have those [development] resources yet. But since we don't and want to offer more products, we have the ability to partner."

Saved by the Auction Bell

Analysts agree that Covisint has struck strong revenue-sharing deals with its partners, but some still question how much value the exchange can provide while it's integrating those products into its platform.

"They identified partners that were willing to sell a piece of their souls to get onto this portal," says Steve Gregerson, an analyst at Automotive Consulting Group Inc., an automotive research firm in Ann Arbor, Mich. "It's difficult to see any level of value-add, considering the [automakers are] spending tens of millions dollars per quarter on Covisint, which is very expensive for the automotive industry."

Kutner disagrees emphatically with that analysis. He projects that these deals will propel Covisint to an initial public offering by 2003. And while Covisint gets up to speed with its new partners, it's also approaching break-even revenue, he says.

"The revenue projections are not where they should be, but they are not horrible," says Kutner. He expects Covisint to be profitable by the end of next year as a result of its strong auction revenue.

Covisint appears to have established an online auctions foothold. GM, for one, says it has conducted about $98 billion in procurement transactions via the online exchange this year. Procurements of direct materials, such as steel and plastics, made up about $96 billion of that total. For those purchases, GM used Covisint's quote-and-auction services and technology. It also spent $200 million for indirect goods through Covisint's catalog system.

Although GM spends roughly $86 billion each year on procurements, the $96 billion tab includes multiyear sourcing contracts and materials purchases for vehicles through the 2006 model year. GM also sold $2 billion worth of materials and machinery through Covisint's online auctions.

Kutner says last year's Covisint auction tab was unusual because it included one large, multiyear deal. He expects Covisint to typically handle $50 billion to $60 billion in auctions from its automotive founders. Still, GM cut its per-transaction costs by 3%, to 17%, Kutner says, and was able to process more orders by using Covisint's technology platform.

Covisint officials also hope the exchange's auction services will lure smaller suppliers that want to aggregate their purchases and reap cost savings. But one of Covisint's biggest challenges remains wooing and winning suppliers.

Several supplier giants, such as Troy, Mich.-based Delphi Automotive Systems Corp. and Dearborn, Mich.-based Visteon Corp., have pledged to work with Covisint. But it will also need to draw the support of smaller players, too, like Guide Corp., a Pendleton, Ind.-based maker of headlights. Guide posted $600 million in revenue last year, while Delphi and Visteon posted revenues of $29 billion and $19 billion, respectively.

Jim Johnson, Guide's CIO, says he's exploring what role Covisint will play for his company. "The real challenge in automotive is driving cost out of process and reducing the cycle time to design a car and its components," says Johnson. "Covisint could play a role in areas that don't have strong systems on the front end and the back end, such as collaborative engineering and product design."

To win small players like Guide with limited in-house staff to customize systems, Covisint must beef up its consulting services and spell out its growing application service provider offerings, according to analysts.

"Covisint is the massive [automaker] initiative that everyone loves to hate," warns AMR's Prouty. "But if you don't have solid vision for suppliers, then every day that goes by, suppliers will make decisions that make it more difficult to include them." ▶

Online Exclusive

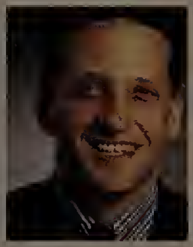
Government regulators put the brakes on Covisint in the beginning, so the exchange is only now getting on track. Read about its rocky start online:

Quick Link **www.computerworld.com/q?25338**

Together

COVISINT: THE ROAD TRAVELED

2000



February: DaimlerChrysler, Ford and GM jointly announce plans to combine efforts and ante up $200 million to form a single global business-to-business supplier exchange. Ford's Kevin Vasconi (pictured at right) is named chief technology officer.

April: French automaker Renault SA and Tokyo-based Nissan Motor Co. join the exchange. The Federal Trade Commission (FTC) begins an antitrust investigation.

May: The exchange is named Covisint.

July: Several Tier 1 automotive supply companies announce their support and intent to sign on.

September: Covisint receives clearance from the FTC and Germany's antitrust agency and officially launches the exchange, with an initial suite of tools for auctions, catalogs, quote management and product development.

October: NexPrise and Engineering Automation Inc. are selected for collaboration and quote management.

November: The integration of Ford's AutoXchange and GM's TradeXchange begins.

December: Covisint LLC becomes a legal entity and signs agreements with Commerce One and Oracle. The exchange selects Documentum Inc. for content management.

2001

February: Covisint taps Mercator Software Inc. to integrate data applications.

March: The exchange chooses SupplySolution for supply chain execution software.

April: Kevin English (pictured at right) is named chairman, president and CEO of the exchange.

May: French automaker PSA Peugeot Citroen SA joins the exchange.

June: Covisint selects webMethods Inc. for software integration.

September: The exchange selects MatrixOne software for collaboration and sourcing, and announces plans to phase out NexPrise.

Supply Chain Management

DEFINITION

Supply chain management (SCM) is the practice of coordinating the flow of goods, services, information and finances as they move from raw materials to parts supplier to manufacturer to wholesaler to retailer to consumer. This process includes order generation, order taking, information feedback and the efficient and timely delivery of goods and services.

BY RUSSELL KAY

IN THE SIMPLEST TERMS, supply chain management (SCM) lets an organization get the right goods and services to the place they're needed at the right time, in the proper quantity and at an acceptable cost. Efficiently managing this process involves overseeing relationships with suppliers and customers, controlling inventory, forecasting demand and getting constant feedback on what's happening at every link in the chain.

The supply chain involves several elements:

- **Location.** It's important to know where production facilities, stocking points and sourcing points are located; these determine the paths along which goods will flow.
- **Production.** An organization must decide what products to create at which plants, which suppliers will service those plants, which plants will supply specific distribution centers, and, sometimes, how goods will get to the final customer. These decisions have a big impact on revenue, costs and customer service.
- **Inventory.** Each link in the supply chain has to keep a certain inventory of raw materials, parts, subassemblies and other goods on hand as a buffer against uncertainties and unpredictabilities. Shutting down an assembly plant because an expected parts shipment didn't arrive is expensive. But inventory costs money too, so it's important to manage deployment strategies, determine efficient order quantities and reorder points, and set safety stock levels.
- **Transportation.** How do materials, parts and products get from one link in the supply chain to the next? Choosing the best way to transport goods often involves trading off the shipping cost against the indirect cost of inventory. For example, shipping by air is generally fast and reliable. Shipping by sea or rail will likely be cheaper, especially for bulky goods and large quantities, but slower and less reliable. So if you ship by sea or rail, you have to plan further in advance and keep larger inventories than you do if you ship by air.

Managing the Chain

Once you've determined all of the elements in the supply chain, how do you manage the chain? There are three main paths in the process:

- **Product flow** includes the movement of goods from a supplier to a customer, as well as customer returns.
- **Information flow** involves transmitting orders and updating the status of delivery.
- **Financial flow** consists of credit terms, payments and payment schedules, plus consignment and title ownership.

QUICKSTUDY

Juggling these elements involves record-keeping, tracking and analysis by many departments. Supply chain software, especially large, integrated packages, combines many different technologies to give a single view of supply chain data that can be shared with others.

SCM applications fall into two main categories: planning applications and execution applications. Planning applications determine the best way to route materials and the quantities of goods needed at specific points. When such applications work well, they make possible the "just-in-time" delivery of goods. Execution applications track financial data, the physical status and flow of goods, and ordering and delivery of materials.

A relatively new SCM option involves Web-based software with a browser interface. Several major Web sites now offer auctions and other electronic marketplaces for buying and selling goods and materials. Also, Web-based application service providers are now promising to provide part or all of the SCM services for companies that rent their services.

SCM is so big that it can be difficult to plan the deployment of such a system. Just remember, a chain connects one link to the next, and an SCM implementation can proceed similarly. Each added link brings more efficiencies. When all of the links are in place, and when the information, goods and finances are flowing properly, the benefits are enormous. This is truly a case in which the whole is greater than the sum of its parts. ▶

Implementation of Supply Chain Management

	TYPICAL FUNCTIONAL SILOS					
BUSINESS PROCESSES	Sales and marketing	Technical	Logistics	Manufacturing	Purchasing	Finance and accounting
Customer relationship management	Account management	Requirements definition	Requirements definition	Manufacturing strategy	Sourcing strategy	Customer profitability
Customer service management	Account administration	Technical service	Performance specifications	Coordinated execution	Priority assessment	Cost to serve
Demand management	Demand planning	Process requirements	Network planning	Capability planning	Sourcing	Trade-off analysis
Fulfillment	Special orders	Environmental requirements	Distribution management	Plant direct	Selected supplier(s)	Distribution cost
Manufacturing flow management	Packaging specifications	Process stability	Prioritization criteria	Production planning	Integrated supply	[illegible]
Procurement	Order booking	Material specifications	Inbound flow	Integrated planning	Supplier management	[illegible]
Product development and commercialization	Business plan	Product design	Movement requirements	Process specifications	Material specifications	[illegible]

SUPPLIERS → CUSTOMERS

SOURCE: ADAPTED FROM THE ARTICLE "SUPPLY CHAIN MANAGEMENT: WHAT DOES IT INVOLVE?" IN THE FALL 2001 ISSUE OF *SUPPLY CHAIN & LOGISTICS JOURNAL*, BY DOUGLAS M. LAMBERT, A PROFESSOR OF MARKETING AND LOGISTICS AT THE OHIO STATE UNIVERSITY'S FISHER COLLEGE OF BUSINESS (*WWW.INFOCHAIN.ORG/QUARTERLY/F01/LAMBERT.HTML*)

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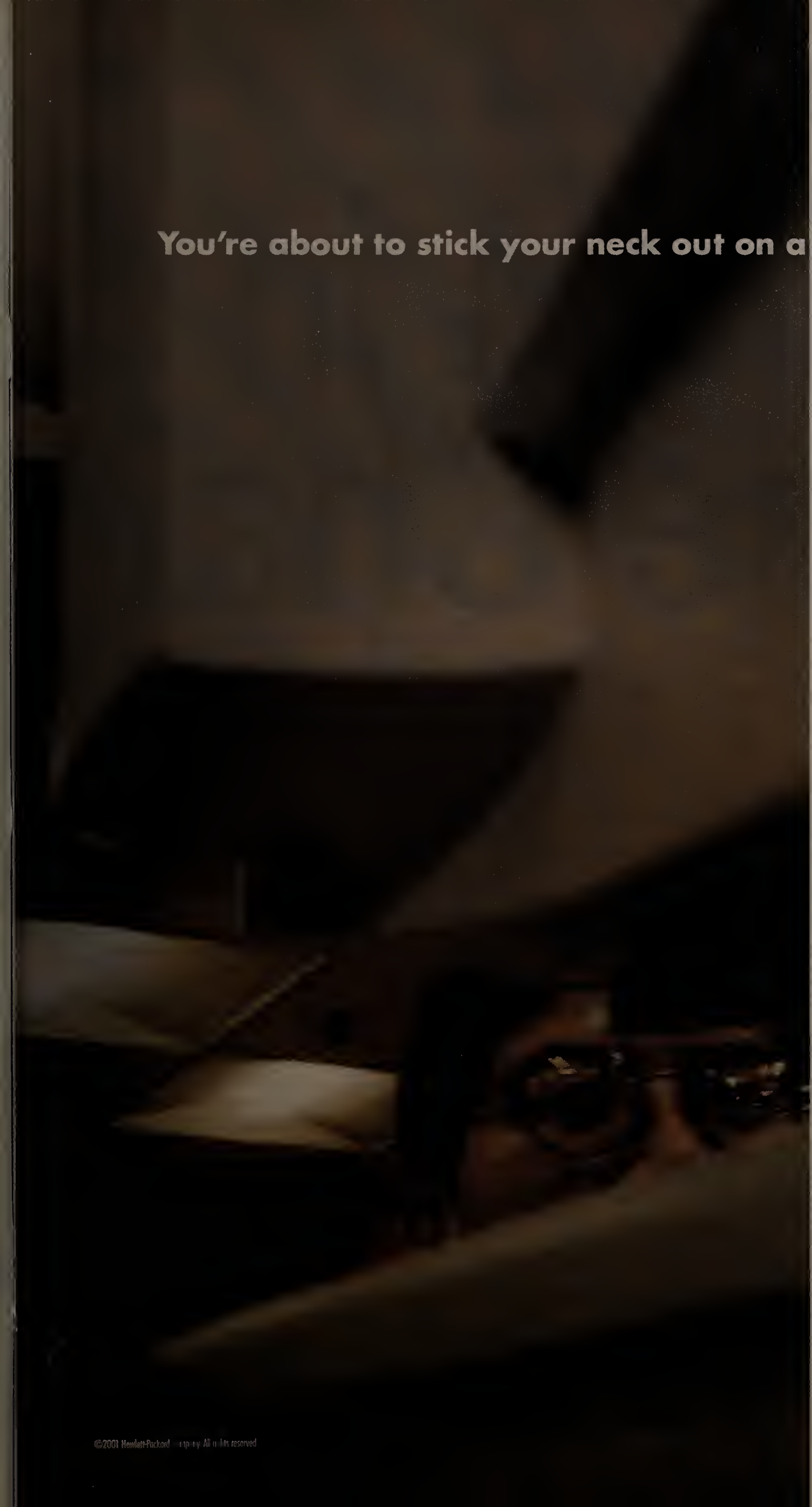

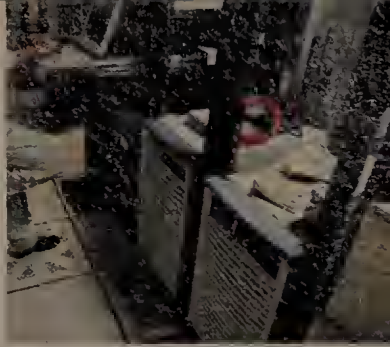

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Kinks in The Chain

Experts identify 10 major barriers to overcome on the path to supply chain project success. By Mitch Betts

YOU'VE HEARD THE WAR STORIES OF enterprise resource planning system rollouts — they're notoriously difficult to pull off. But supply chain management system projects may be even harder, given that they must unite not only the often-warring fiefdoms within a corporation but also the thousands of suppliers outside it.

Maybe that's why supply chain management is still in its infancy and no one has yet accomplished a fully integrated supply chain system, according to an in-depth study of 254 companies by researchers Stanley E. Fawcett and Gregory M. Magnan for the Center for Advanced Purchasing Studies (CAPS) in Tempe, Ariz. "Nobody is managing the entire supply chain from suppliers' supplier to customers' customer," the 2001 study concludes.

The potential payoff can be huge. A study by Peter J. Metz, executive director of the MIT Center for eBusiness, found that some companies achieve impressive bottom-line benefits, such as a 50% inventory reduction or a 40% increase in on-time deliveries.

But then there are the disasters, such as Beaverton, Ore.-based Nike Inc.'s announcement in March that installation problems involving new supply chain applications were largely to blame for an embarrassing profit shortfall [News, March 5].

Most supply chain projects probably fall somewhere in between. "What usually happens with these projects is that the momentum wanes as people have to work hard and make it happen," says Robert E. Sabath, director of the supply chain practice at Deloitte Consulting in Chicago.

Computerworld talked with Sabath and two other supply chain consultants — Jeff Kavanaugh, vice president of supply chain management at Inforte Corp. in Chicago, and Brent Habig, CEO of Tigris Corp. in New York — to identify the major barriers to supply chain success.

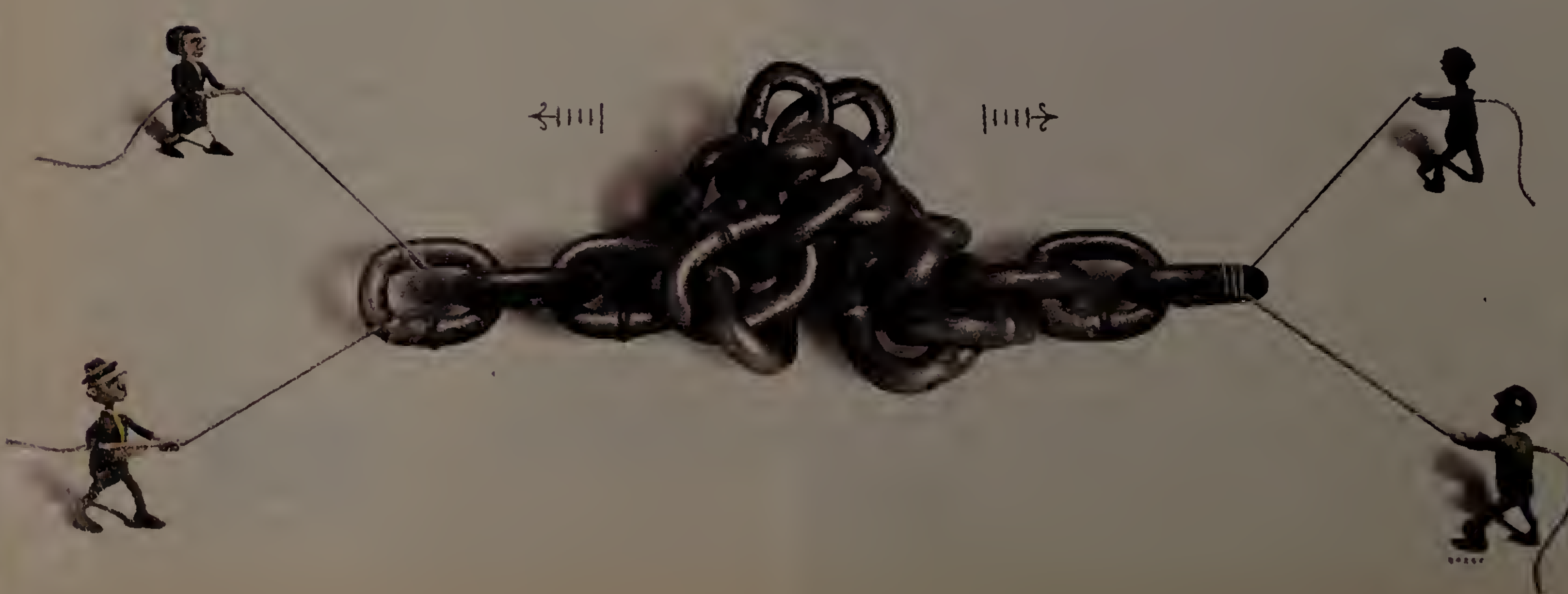
1 Departmental warfare.

Or, at least, passive resistance. Supply chain projects involve multiple departments, such as purchasing, planning, manufacturing, distribution and IT. At worst, this can mean turf wars. Even at best, different departments may support the overall goal but have conflicting priorities.

"More than hostility, you see people dragging their feet," Habig says. One classic conflict: Marketing folks want to have plenty of inventory of a blockbuster product to make sure they don't run out, whereas the goal of the inventory manager is minimal inventory. Balancing those interests is a "significant political challenge," Habig says.

2 Weak leadership.

Because multiple departments are involved, supply chain projects need a strong, senior-level executive who can "be the tiebreaker," Kavanaugh says. "It re-



RICHARD BORGE

quires leadership, because there will be challenges that come up. There needs to be a person of strong character who makes it happen . . . because there will be a thousand reasons why something might not work."

Habig agrees, suggesting that the top sponsor needs to be at the executive vice president level or that perhaps a senior steering committee should act as the project's board of directors.

3 ROI is hard to measure.

This is one reason it's difficult to get strong executive sponsorship. If the return on investment is simply "greater customer loyalty," that's a hard sell with the board of directors, given the competing demands for capital investment.

The problem is that "the costs are not hard to quantify. The benefits are soft, but there are a lot of hard dollars being spent," Kavanaugh says. It's especially tough for public companies worried about quarterly earnings reports because it can take years to see the bottom-line benefits.

4 Funding problems.

A company may decide to spend $30 million on a supply chain system, but if it doesn't make its quarterly numbers, the quick fix is to put the expensive project on the back burner. When that happens, IT project members move on, momentum is lost and consultants leave (and you don't get the same ones back later), Sabath says.

Kavanaugh says many companies are moving to a new strategy of "dynamic budgeting," meaning they have a list of priority projects to fund. "As long as you're working on the top couple [of items], you're fine," he says. "But if you're No. 10 and revenues go down, maybe they don't fund past No. 7." So sustaining funding for the life of a supply chain project that may take four to six years, is challenging, to say the least.

5 Scope creep.

Imagine a typical project design meeting, in which each department chimes in to suggest great features the supply chain system should have. "Many times, we see projects over time get overcomplicated" with feature add-ons, Habig says. "By the end of that, you end up with a bloated project that is so extensive that it will take forever to accomplish, or if you do accomplish it, you don't get a solid return on the investment" because it's so expensive, he says.

Someone (see No. 2) has to make the tough calls, keep the project focused on the core business benefits and "throw some things out of scope," Habig says.

A related problem is trying to optimize the supply chain for every customer and product. "But you can't do that for every customer, every product, every transaction. If you do, the very best customers get shortchanged. That will bring down the new system," Sabath says. It's much better to make sure the supply chain works flawlessly for the top five customers and the most profitable products, Sabath emphasizes. In other words, some customers and some products are simply more important than others.

6 Legacy systems aren't integrated.

Maybe the new supply chain system works fine but there are islands of incompatible legacy systems that weren't integrated. "Sometimes they can be integrated at a transaction level but not at the overall management level for common reporting and analysis," Habig says. "You need to create a layer on top of these systems that aren't talking that pulls them together so that you have visibility over the full picture." That would allow you to extract data for a consolidated report, for example.

Just think: What gives a company its competitive edge is probably housed in those customized legacy systems, Kavanaugh says. "The fact that the new packaged applications don't always link back to them is a problem," he says. "A new supply chain system won't be valuable if you don't bring along those competitive advantages, so you need to integrate those legacy systems."

7 Getting small businesses on board.

True supply chain integration beyond the first tier of big suppliers is rare, the CAPS study concludes. "The task of managing beyond the first tier is handed off to the first tier with only minimal measurement and follow-up," the study says. Part of the problem is that small businesses — many of which are quite happy relying on faxes, e-mail and spreadsheets — often lack the resources to automate up to the standards of the big companies.

"The way you solve that is for the channel master to use software that can import and export data from spreadsheets," Kavanaugh says. "In other words, allow someone to exist at the spreadsheet level. And the good news is that, with a properly formatted spreadsheet, you can collaborate with that just fine." (See page 48.)

8 Data quality problems.

The CAPS study found that the No. 1 requirement for a successful supply chain integration is this: "Establish information systems capable of sharing real-time, accurate and relevant information." But lots more attention is lavished on the IT — the "piping" — than on the "quality of the data and making sure it's the right data for the decisions that need to happen," Habig says.

"You need highly structured, standardized bills of material, catalogs, part substitution [a taxonomy that recognizes substitutable parts] and standards between different companies and different industries," Kavanaugh says. "Content is a huge, if not glamorous, part of supply chain problems." (See page 42.)

9 Sabotage by well-meaning employees.

Sometimes your best employees — the ones really trying to please the customer — are the ones who foul up the new supply chain system. For example, if salesmen who need 100 of an item request 110 just to make sure they'll have enough, then the company has a false sense of demand, and inventories will swell.

The key to preventing this is to change the way employee performance is measured, Kavanaugh says. "If the salesperson is measured on how accurate they are in predicting sales, not just in how many they sell, those problems will start to go away," he says.

10 Old habits die hard.

Remember that supply chain work was getting done before the software came along. So the biggest competition for supply chain software is the status quo: e-mail, faxes, the phone and spreadsheets.

Furthermore, a certain cynicism is creeping in. "Many materials managers view supply chain management as another management fad," the CAPS study says. "They believe that the term is beginning to mean 'everything and nothing' at the same time." ◗

Tips for Success

OK, so we've identified the barriers to successful supply chain projects. But how do you overcome them?

- Gain support from senior executives and departmental managers.
- Ensure that the company is ready for the software project, with adequate resources, re-engineered processes and high-quality data.
- Recognize that the supply chain software market is immature and more than one vendor may be required.
- Define the requirements before evaluating various software products.
- Test software products for scalability before purchasing.
- Simplify the supply chain network by reducing the number of suppliers, then form close relationships with carefully selected suppliers. Not all supply chain partners are equal.
- Start with a pilot project involving one or two suppliers and limited transactional data sharing.
- Consider outside hosting services for business-to-business collaboration systems.
- Encourage open and honest information-sharing.

SOURCES: GARTNER INC., STAMFORD, CONN.; CENTER FOR ADVANCED PURCHASING STUDIES, TEMPE, ARIZ.

Online Exclusive

As if 10 barriers weren't enough, our Web site identifies four more to surmount in the quest for supply chain nirvana:

Quick Link **www.computerworld.com/q?25235**

Your Crystal

For an efficient supply chain, you need to predict how many of which items will be needed where and at what time. No, demand planning isn't easy, but the payback can be huge.

By Robert L. Mitchell

DEMAND PLANNING
FIELD REPORT

ONE CRITICAL ELEMENT in managing the supply chain is predicting how much of specific materials, parts and products will be needed at a given location at a given time. If you can accurately plan for such demand, then you can manage inventory levels very tightly.

The payback can be huge. Bandag Inc., a $1 billion manufacturer of tire retread products in Muscatine, Iowa, deployed demand planning software that cut back supply orders by 50% and peak inventory by 25% in the first year of operation, says Greg Harris, manager for production planning and logistics (see story at right). But implementing a large system can cost seven figures, and success depends on having clean historical shipment or order data that the forecasting system can leverage.

Although the technology has been around for several years, many suppliers still don't use it. While some suppliers, including Unilever (see case study below), are taking full advantage of the state of the art, market leader i2 Technologies Inc. in Dallas says that in 50% of new installations, no automated demand planning systems are in place.

"Microsoft [Excel] is the most widely deployed demand planning tool in the world," says Karen Peterson, an analyst at Stamford, Conn.-based Gartner Inc. But it lacks sophisticated forecasting algorithms, can't track multiple inputs and can't slice and dice the data for different audiences, she says.

Market pressures are forcing more companies to adopt demand planning systems. "Big retailers like Wal-Mart . . . can dictate terms to suppliers," says Rajesh Varma, director of demand planning at Leiner Health Products Inc. in Carson, Calif. (see story at right). "Unless you have the appropriate forecasting tools in place, you'll never sell these customers."

CASE STUDY:

Unilever Crosses The Data Streams

"We had a dedicated team experienced with [the product], and this was their life for a year."
– Raz Caciula, Unilever

Unilever's demand planning system is pushing the state of the art. Two and a half years ago, three business units were merged. Each used software from Rockville, Md.-based Manugistics Group Inc., but each implemented it differently. The current system, which also uses Manugistics software, blends historical shipment data with promotional data and allows information sharing and collaboration with key customers.

Statistical information is "completely ineffective for the part of the forecast driven by events, promotions, rollouts and special packages," says Raz Caciula, director of best practices at the consumer products maker's U.S. headquarters in Greenwich, Conn. The company has designed a process through which planners augment statistical forecasts with sales systems that plan promotions. For each promotion, the sales planning system predicts the "lift," or projected increase in sales, and routes it to the demand planning system, which applies it to appropriate stock-keeping units and distribution centers each week. Planners review those forecasts and make adjustments. Unilever also uses external market research in sales planning but not in the demand planning system. The company is experimenting with point-of-sale (POS) data as well. "We compare POS data and forecasts that come directly from customers with our own forecasts," Caciula says. That data helps drive the final forecast but isn't incorporated into the model yet.

Unilever collaborates on statistical and market promotion forecasts for key products with a few large customers, using a collaborative system from Waltham, Mass.-based Syncra Systems Inc. Final numbers are negotiated in weekly meetings and fed into the demand planning system.

The benefits have been worthwhile, but the process was hard. "We had a dedicated team experienced with Manugistics, and this was their life for a year," Caciula says, adding that expensive tools are only a small part of the total cost. He says the system has reduced inventory and improved customer service, but he gave no specific numbers. Caciula hopes to see dramatic improvements through more customer collaboration and use of POS data.

JUST THE FACTS

How Unilever Did It

- **Unilever's system forecasting is built on the foundation of shipment history and current order information.**
- **Internal sales projections, retail customer promotions and external market research are analyzed and combined before being fed into the demand planning system.**
- **Retail POS forecasts and actual sales data will improve accuracy and reduce inventory lead times, but they are available only for a few large customers.**
- **Integrating promotions data was an expensive, yearlong effort, but the resulting inventory reductions made the return on investment worthwhile.**

Ball

TECH CHECK:

Getting Demand Planning Right

Demand planning systems go beyond what simple forecasting tools offer. "Forecasting tends to be single-number. With demand planning, we actually have different components of what that number is. Salespeople may be looking at a particular region by revenue, while operations folks are looking at it by quantity," says Gartner analyst Karen Peterson.

The systems produce baseline forecasts from shipment or order history data, so reliable data is a critical requirement. "In 50% to 70% of implementations, [users pull] data from disparate legacy systems," and that data is often inaccurate. Cleaning it is the biggest hurdle to implementation, says i2's product marketing manager, Karen Laucka.

Once a baseline forecast is established, other data can be layered onto the model. Leiner Health feeds data about historical shipments into its i2 system and then adds order history information. In that way, back orders that never shipped are accounted for in the forecast, says Rajesh Varma, director of demand planning. Adding customer point-of-sale (POS) data improves accuracy, but not all customers will provide it, and integrating it isn't easy. "If we could get POS information, it would reduce inventory lead time by as much as five days," Varma says.

LEINER HEALTH

Gross sales:

$650M

Reduction in inventory after three years:

$10M-$15M

"The problem is [customer data] comes in all different formats, and building those interfaces is a daunting task," says Noman Waheed, a senior manager at consulting firm Accenture Ltd. in New York. Most suppliers today concentrate on receiving POS data from a few large customers.

BANDAG

Drop in back orders in the first year after implementing demand planning software:

50%

Reduction in peak inventory:

25%

To this mix, suppliers may also add data for events such as trade promotions, inserts, seasonality and more. "All of those have an impact," says Waheed, but "most organizations have trouble getting historical sales data, never mind this data." Finally, suppliers can add in nonstatistical data, such as sales and marketing forecasts, or market data from research companies.

At this point, "I have four or five data streams and can find variances between forecasts," says Waheed. Automated tools can spot variances, but management still makes the final call in a "consensus process where all the representatives sit down" and discuss specific customers and specific sales periods, he explains."This is cumbersome, but it's the most effective method we have come across," Waheed says.

Initially, companies should focus on specific goals such as reducing inventory and improving customer service, says Phil Robers, global director at Paris-based consulting firm Cap Gemini Ernst & Young. But they should then go beyond that. "If you understand demand patterns, you should [use] things like promotions to influence demand in your favor."

The next step is supply chain collaboration, where retailers and suppliers share forecasts, promotion plans and other data to determine the final forecast.

"True collaboration means we look at the same data, manipulate the data and come to the same conclusion – all online," typically by giving customers Web access to forecast data, says Mike Maguire, SAP AG's vice president of supply chain field operations. Though many suppliers collaborate with a few key customers on forecasts, few do it online due to customers' reluctance to share data and the complexity of maintaining such relationships.

Greg Harris, Bandag's manager for production planning and logistics, says that after three years, he's still optimizing the use of internal data. He welcomes customer data, but he'd be cautious about letting customers manipulate forecasts. "You're relying on the customer to have the same expertise that you do, and that's not the case," he says.

Ultimately, says Peterson, "we'll see application-to-application integration" between suppliers and customers using technologies such as XML, and collaboration will be part of that process. But for now, integration is a big headache. "If two trading partners want to integrate information differently – integrating products into different geographies, for example – today, it's done on a customized basis," she says. "Configuration rather than coding is where we want to evolve. Today, it takes a lot of pain and effort to make these work."

Online Exclusive

Tips from the field: For advice from IT managers who have deployed demand planning systems, visit our Web site: **www.computerworld.com/q?25432**

Quick Link

VENDOR CHOICES:

Know the Differences

Demand planning system vendors sell both software and implementation expertise. Many vendors have developed experience in specific market segments and offer best-practice information and forecasting engines with algorithms that are optimized for those industries. Vendors fall into two groups: best-of-breed vendors, and ERP vendors that offer an emerging class of integrated demand planning modules.
Key players in this market include:

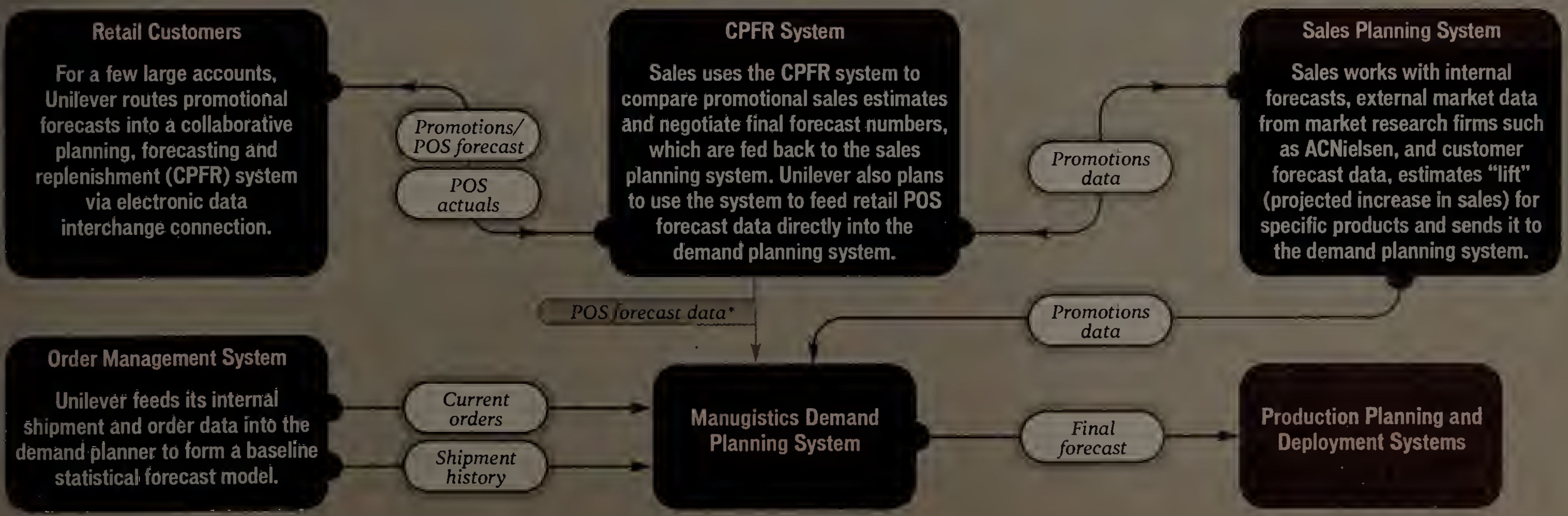
BEST OF BREED

- **i2Technologies Inc.:** Market leader with most vertical-market modules – and most expensive offerings.
- **Manugistics Group Inc.:** Offers best integration with other applications.
- **Logility Inc.:** Proven track record in consumer goods and collaborative planning, forecasting and replenishment.
- **Prescient Systems Inc., Demantra Ltd.:** Both have well-established offerings for distribution, media industries.

INTEGRATED PRODUCTS

- **SAP AG:** Less expensive to install than best-of-breed offerings, but its technology is still evolving.
- **Oracle Corp.:** Relatively new on the scene; its offerings are still maturing.

Unilever's Demand Planning and Forecasting System



Retail Customers

For a few large accounts, Unilever routes promotional forecasts into a collaborative planning, forecasting and replenishment (CPFR) system via electronic data interchange connection.

CPFR System

Sales uses the CPFR system to compare promotional sales estimates and negotiate final forecast numbers, which are fed back to the sales planning system. Unilever also plans to use the system to feed retail POS forecast data directly into the demand planning system.

Sales Planning System

Sales works with internal forecasts, external market data from market research firms such as ACNielsen, and customer forecast data, estimates "lift" (projected increase in sales) for specific products and sends it to the demand planning system.

Order Management System

Unilever feeds its internal shipment and order data into the demand planner to form a baseline statistical forecast model.

Manugistics Demand Planning System

Production Planning and Deployment Systems

* PLANNED

"Waiter! There's soup on my fly!"

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@ business infrastructure

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KEVIN FOGARTY

Courting the Dispossessed

DON'T LET THIS MAKE YOU NERVOUS, but if you're building or extending a supply chain management system designed to automate transactions with buyers and suppliers, the people whose functions you're trying to reduce or eliminate are the ones who will ultimately make it either work or fail.

You know these people. But you may have succeeded in avoiding them since you made it to a high enough position on the help desk that you no longer have to fix mysterious system problems caused by smiley-face magnets on their PCs.

OPINION

They're data entry managers, accounts receivable managers and customer service specialists, all of whose work represents the expensive, slow part of the supply chain.

But they're also the final fail-safe for your supply chain system — the human middleware that's flexible enough to adapt to new processes and customers even before you tie them into the network. They resist change to their own processes, but they can adapt a lot more quickly to new customer problems than to the software you're building.

They don't mind keying in order data, even when they do it with a green-screen application whose codes and formats they spent years learning. That's their job, and by doing it, they can connect customers who work with incompatible systems, customers who insist on faxing in orders or those who just get the orders wrong.

Market research firm Killen & Associates Inc. in Palo Alto, Calif., estimated earlier this year that one-fifth of all business transactions — most of them hand-keyed — have errors that can delay payments by at least a month. That can cost a $1 billion company more than $32 million per year, the report said.

A lot of those errors come from miscoding by your own people, but most of them come by way of miscodes from other companies — errors you can't possibly correct automatically.

Based on the technology and best-practices information available, there are basically three ways to minimize those errors:

KEVIN FOGARTY is a former *Computerworld* editor. He can be reached at kevinfogarty@yahoo.com.

■ **The macro tech approach.** This embraces standards throughout your whole system and helps your buyers and suppliers do the same. It will reduce friction and errors for everyone.

Try the XML-based set of standards being developed by RosettaNet, a nonprofit consortium made up largely of technology companies whose specs are among the most widely regarded.

Standards-based exchanges are your Holy Grail. Enjoy them when you can get them, but don't count on getting them all the time.

■ **The micro tech approach.** Add a layer of supply chain event management (SCEM) software onto your system. These applications are designed to sit on the servers and monitor the process by flagging late orders, logging shipments and looking for discrepancies in orders and other errors. They're being built into applications from SAP AG, J.D. Edwards & Co. and others and are sold as stand-alones by companies such as HighJump Software Inc. in Eden Prairie, Minn. That minimizes the errors when they occur.

■ **The fallback factor.** The third approach is to get those data entry managers and departmental order-takers on board not only to ease the political process of rolling out your system, but also to give your system an automatic fail-over capability that can take into account random customer errors, new customer problems and other integration glitches for which IT can't possibly plan.

Get too automated, and you can't deal efficiently with these people. But in this economy, you can't afford to ignore them.

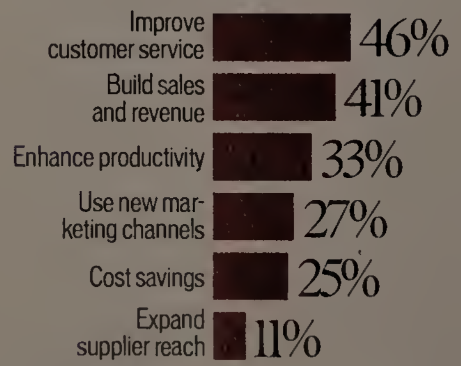
So build your own people into the workflow plan to deal with problems the SCEM can't handle, and build the time and money they cost into your budget projections. You'll still vastly reduce the amount of expensive human intervention required, but you won't be caught unprepared when something changes too fast for your system to handle.

After all, people don't just cause system failures; sometimes, they can fix them, too. ◗

Supply Chain Trends

Top E-Business Priorities For Manufacturers

Supply chain functions rank low on the list because of the risks, lack of standards and enormous level of effort and expense required.

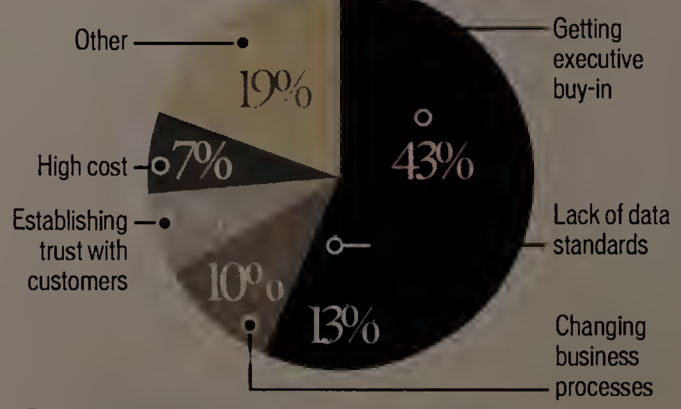


Base: 788 manufacturers

SOURCE NATIONAL ASSOCIATION OF MANUFACTURERS WASHINGTON ERNST & YOUNG LLP, NEW YORK NOVEMBER 2001

Biggest Problems

Automotive suppliers cited these as the biggest challenges when implementing e-business technologies:

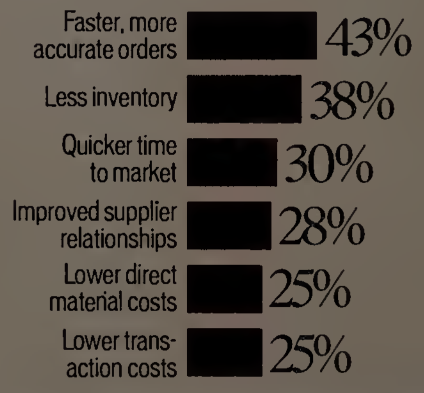


Base: 30 automotive suppliers in North America; percentages don't total 100% because of rounding.

SOURCE FORRESTER RESEARCH INC., CAMBRIDGE, MASS. SEPTEMBER 2001

Benefits Expected

Supply chain executives hope that sharing information online with suppliers will yield the following:



Base: 40 supply chain executives; multiple responses allowed.

SOURCE. FORRESTER RESEARCH INC., CAMBRIDGE, MASS., SEPTEMBER 2001

ANNA'S LOOKING FOR A LONG-TERM RELATIONSHIP.
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Dirty Data

Inaccurate data can ruin supply chain projects. By Mitch Betts

THERE ARE MANY WAYS that a supplier named IBM could be entered into a supply chain database: IBM Corp., I.B.M. Corporation, International Business Machines Corp. or a host of other variations.

Any one of those monikers might work well enough for a specific transaction. But if a company wants to see how much business it's doing with IBM overall, the name variations become a problem. The company might be doing $100 million worth of business with IBM, yet a database query might show only $20 million, depending on which name is used in the query.

The result is that the company wouldn't have a complete, accurate view of its suppliers so it could negotiate better deals and volume discounts.

"We see 20% duplicate supplier records," says Craig Verran, assistant vice president for supply chain solutions at The Dun & Bradstreet Corp. in Murray Hill, N.J., which helps companies clean up their supplier files.

That's just one small example of how uncleansed data gives a company the wrong picture of its supply chain.

"Companies are making bad operational decisions every day of the week [and losing money] because of bad data quality," says Ted Friedman, an analyst at Gartner Inc. in Stamford, Conn.

Poor data management is costing global businesses more than $1.4 billion per year in billing, accounting and inventory snafus, according to a survey of 599 companies by PricewaterhouseCoopers in New York. One-third of the companies say that "dirty data" forced them to delay or scrap a new system.

RICHARD BORGE

"We have had major [supply chain] software projects fail for lack of good data," says Donald Carlson, director of data and configuration management at Motorola Inc.'s semiconductor products group in Austin, Texas. In a presentation at a recent data quality conference, he recalled how a new supply chain planning system had to be scrapped because bills of material were hit by a triple whammy: incomplete data, inaccurate data and different data formats in different countries.

"We could do a supply chain plan for Hong Kong, we could do one for Scotland, but we didn't have a standard methodology," Carlson says.

Carlson was given the task of fixing the problem in late 1998, and he's well on his way. Many data problems have been ironed out, and now there are "data stewards" — people assigned to make sure the data stays clean.

There are two fatal mistakes users make when it comes to data quality. The first is to neglect data issues in the rush to install a software package. "Many companies are oblivious," Friedman says. "They don't take the time to quantify the pain that they're experiencing as a result of poor data quality."

The second is to clean up data for a specific IT project instead of finding the source of the data problems. Companies may turn to data-cleansing companies, such as Vality Technology Inc. in Boston and Firstlogic Inc. in La Crosse, Wis. They may even try to identify problems by using analytical tools from data profiling vendors, such as Evoke Software Corp. in San Francisco and Metagenix Inc. in Durham, N.C.

But these efforts tend to be one-shot deals. "People put a Band-Aid on the problem by cleansing data [for a particular software project], but they're not going back to fix the root cause of the problem," Friedman says.

Ideally, a company would undertake a continuous campaign to make sure data that enters the system is clean — and then stays that way. Some of the job can be forced onto suppliers that feed data into the system by setting strict requirements for data formats.

But it's also important for trading partners to establish business rules — or what used to be called a data dictionary — about the semantics of the data, since different systems define data fields in different ways.

For example, companies need to establish rules for what to call things: Are they pants, slacks or trousers? Does 06-03-2001 mean June 3 or, as Europeans might say, March 6? Or, take the database field called Invoice Date. Does that refer to the date the supplier put on the invoice, or the date the invoice was received?

"Something that seems very simple is, in fact, very complex," says Brent Habig, president of Tigris Consulting, a supply chain consultancy in New York. "And you need to be very careful when pulling data from different systems together to make sure that it's the right field name, the right format and that semantically, it means what you want it to mean." ◗

Online Exclusive

A study conducted by PricewaterhouseCoopers argues that data quality is too important to be left to CIOs alone – it needs to be a boardroom-level issue.

Quick Link **www.computerworld.com/q?25303**

Housecleaning

Rules of thumb for a data quality initiative:

- First, establish the processes to prevent errors. Then clean up the existing errors.
- Start with critical data suppliers: Insist they provide accurate and current data.
- Focus on the most important data.
- Meet the most important data needs of the most important customers.
- Don't be seduced by cleanup tools. They're no substitute for preventing errors.
- Pick specific software tools to solve specific problems rather than general tools for general problems.

SOURCE: *DATA QUALITY: THE FIELD GUIDE*, BY THOMAS C. REDMAN (DIGITAL PRESS, 2001).

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It will take time — and more mature software — before companies will trust online technologies for direct procurement of mission-critical parts.

By Michael Meehan

IT'S ONE THING TO use e-procurement technology to buy office supplies, through a process known as indirect procurement, because the goods aren't needed for the assembly line.

But it's quite another to use the technology for direct procurement, such as buying the parts for manufacturing a helicopter. The complexity, importance and risks are much greater.

That's why Bell Helicopter Textron Inc. has already implemented online procurement software for office supplies but is taking a much more cautious approach with direct procurement of helicopter parts.

"Safety is a paramount concern in our business, and we're heavily regulated," says Matt Cordner, director of strategic planning for operations. "When we make changes like this, we have to be deliberate."

The Fort Worth, Texas-based firm is in the middle of a two-year supply chain project with Dallas-based vendor i2 Technologies Inc., which will bring it to the doorstep of being able to procure online the parts and services needed to build the helicopters it sells.

In many ways, direct procurement looms as the Holy Grail of supply chain technology. The ability to instantly order what you need from a supplier that can instantly fill the order is supposed to lead to lower inventory, faster product cycles and all the other benefits touted in supply chain conference slide shows during the past three years.

Yet, what looks so good on slides has proved more treacherous than snorkeling in the Amazon. Smaller companies lack electronic order-processing capabilities, and large enterprises struggle to collect the information they need to place timely orders.

So companies are doing indirect procurement first, before tackling its tougher sibling.

Alain-Michel Diamant-Berger, director of e-commerce at New York-based Schlumberger Ltd., started with an indirect procurement implementation in 1999. He says he expects 77 field operation locales to be using the tool by the end of next year. After that, Diamant-Berger plans to look at direct procurement for the oil-field services giant.

His checklist for the system: It must be compatible with the existing procurement system from Pleasanton, Calif.-based Commerce One Inc.; it must link internal product divisions and external suppliers; and it must work independently of an enterprise resource planning (ERP) backbone, because Schlumberger doesn't have a

THE ROI REALITY

Conclusions of a recent report from Cambridge, Mass.-based Forrester Research Inc., "Wringing ROI Out of E-Procurement":

- E-procurement projects are still an early-adopter phenomenon, based on poorly quantified return on investment and undue optimism about supplier readiness.
- Early online procurement projects have suffered from excessive hype about savings.
- Of 15 pioneer users interviewed, none has documented actual savings, and only one has completely deployed its e-procurement system.
- Users must set limited, realistic goals and try to wring short-term benefits in today's cost-conscious climate.
- Attempts by Commerce One and Ariba Inc. to support direct materials procurement have so far been a bust.

worldwide ERP system.

"It will be a big project, and that is why we want to finish one before we start the other," he says.

Software providers are trying to help. In recent months, procurement, supply chain and ERP vendors have been trotting out "sourcing" products. The software creates an electronic request-for-proposals form, disseminates it on the Web and then scores the responses for the requesting organization. Ideally, the software should also pull information from supply chain applications and help the company to quickly replenish its stores.

Rocky Months Ahead

However, Karen Peterson, an analyst at Gartner Inc. in Stamford, Conn., warns that "most of these products are niche solutions or are still immature." Consequently, she expects a spate of scalability and back-end linkage glitches similar to what users experienced with the initial implementations of indirect procurement software.

Peterson envisions a few more months of heightened expectations, followed by numerous failures and widespread disillusionment, before fully robust direct procurement tools become widely available.

To be really robust, the software will need to work on multiple architectural tiers of decentralized enterprises with the agility to communicate with every kind of supplier system imaginable.

Patrick Wildenburg, vice president of business-to-business e-commerce at Delta Air Lines Inc. in Atlanta, agrees with Peterson. Vendors are three to five years away from building tools that allow companies to perform accurate demand-planning and seamless data sharing with suppliers, he says.

Furthermore, generic e-procurement software may not be good enough in some vertical industries that have complicated needs. Kevin Cronin, global e-business director at Summit, N.J.-based engineered plastics manufacturer Ticona, says he works in a "98% order-specified business" and doesn't envision any quick fixes.

Ticona, a unit of Germany-based chemical giant Celanese AG, has "a very complex ordering process with deliveries into different dates, shipping locations and line items," Cronin says. "We're at least going to need a tool that's specific to this industry."

More than that, he wants software that makes engineers an active part of the ordering process and says that's where "the real value" lies for Ticona.

The same is true for Bell Helicopter. Cordner estimates that 70% of his company's costs are fixed once engineers submit their plans. "We need tools that make sure engineers are making the best decisions," he says.

Users are learning that like the Holy Grail, direct procurement will prove difficult to find, but as in the legend, it's a goal worth chasing. "We want to get there," Cronin says. "But we're going to have to pace ourselves." ◗

ps

Online Resources

Academic papers about online procurement are available at:

- www.ascet.com
- www.capsresearch.org/practix.htm
- www.haas.berkeley.edu/citm/procurement

REID HORN

The people costs of doing this are enormous, and I don't think companies have fully grasped that yet.

MATT CORDNER, DIRECTOR OF STRATEGIC PLANNING FOR OPERATIONS, BELL HELICOPTER TEXTRON INC.

Other Challenges That Lie Ahead

Users also cite the following four challenges in the quest for online procurement of direct materials:

1. The need to manage the changes in organizational processes and human resources. Although Bell Helicopter Textron has 11 factory planning modules in place and all of its part numbers cataloged, employees will still need to learn to use the new system, says Matt Cordner, director of strategic planning for operations.

Cordner explains that while the cost of the IT project may be "multiple millions of dollars," the company may spend "five to seven times more to change behavior in this project than on software. The people costs of doing this are enormous, and I don't think companies have fully grasped that yet."

Cordner says Bell Helicopter will first target manufacturing commodities like fasteners and tools as it begins to wade into an online model for direct procurement. After that, he expects to work out trading agreements with other business units under the umbrella of Providence, R.I.-based Textron Inc., such as The Cessna Aircraft Co. or Textron Aerospace Fasteners. After that, Cordner says, "we'll be ready for the outside world."

2. The need for centralized systems management. The Hague-based Royal Dutch/Shell Group has undertaken a mammoth IT project it calls its MegaCentre. The project will link 60 different SAP AG ERP systems and a companywide SAP e-procurement system.

Houston-based MegaCentre program manager Carl Krite identifies a rarely discussed aspect of supply chain and procurement systems in multinational corporations like Shell: the need for rock-solid systems management.

Shell chose Houston-based BMC Software Inc.'s Patrol software for the job. It will have to monitor every server in more than 200 locations worldwide to make sure the applications run smoothly.

"It's the glue that makes everything else work," Krite says. "Without this piece, every outpost is still left to operate in an autonomous fashion."

3. The lack of standards. Tom Warner, an e-commerce initiatives manager at The Boeing Co. in Chicago, has been active in establishing trading standards within Washington-based Aerospace Industries Association of America Inc. While the group has developed business-to-business trading standards for its members, there's no guarantee that Boeing will use them, because the aircraft manufacturer is also active in other standards bodies and online marketplaces.

"What I'm trying to do is come up with trading standards that leverage technology that most companies already have in place," Warner says. "I want to let my company do something [soon] rather than have it wait on a perfect solution."

4. The difficulty of getting small suppliers on board. At Caterpillar Inc. in Peoria, Ill., Director of E-Business Mike Hackerson has partnered with IBM to get smaller suppliers the middleware and hardware needed to move from phone and fax connections to an online procurement model.

"If we don't get in the trenches and help our partners build these systems, we won't be able to migrate our own systems," he says. "We have to get deeper into our supply chain if we want to realize the [payoff]."

– Michael Meehan

Just in Case

Supply chain disruptions since Sept. 11 have managers rethinking just-in-time inventory management. By Mitch Betts

THE SEPT. 11 terrorist attacks shattered many Americans' sense of security. They also shattered many supply chain managers' devotion to the strategy known as just-in-time inventory (JIT), a near-religious belief that parts and products should show up just moments before they're needed so that on-site inventory is near zero.

The terrorist attacks caused a temporary shutdown of air traffic nationwide along with longer waits for security inspections of trucks at border crossings. It was a major disruption of the country's normally smooth-running transportation system — and a wake-up call for supply chain managers, who scrambled to find alternative transportation modes and even today find that border crossings that formerly took hours now can take days.

A week after the Sept. 11 attacks, 39% of supply chain managers called the disruptions dramatic, 52% reported a slight impact and 9% saw no effect on deliveries, according to a survey by *Purchasing* magazine in Newton, Mass.

To some extent, businesses have always had to deal with supply chain disruptions such as labor strikes that prevent the delivery of critical parts. But the extra security measures resulting from the Sept. 11 terrorist attacks may have a farther-reaching and longer-lasting effect on supply chain systems.

Some companies announced that they were going to "change from just-in-time to a just-in-case inventory position," says Scott Stephens, chief technology officer at the Supply-Chain Council Inc., a Pittsburgh-based industry consortium. That means adding more "safety stock" to cope with delivery delays — a sharp departure from JIT principles.

But the change goes deeper than that. Experts say that in the midst of a long global war on terrorism, companies will want supply chain systems that give them greater visibility into what's happening at suppliers and where goods are at any given time, in case they have to make fast adjustments. They'll want supply chains that balance efficiency with flexibility, resilience and reliability.

"Rather than focusing on wringing every last ounce of inefficiency out of the supply chain, companies are now seeking to ensure continuity of operation," said analyst Bruce Bond in a bulletin from Stamford, Conn.-based Gartner Inc.

And that's where the IT department comes in. Its new mission is to build "advanced planning systems and decision-support software that enable the supply chain planners to plan for a wider range of conditions," Stephens says. "You'll see a greater emphasis on real-time sharing of demand, inventory and shipping information. If we can react quicker to a disruption, then we carry less inventory, or we have to carry less safety stock."

Companies that already had robust supply chain management software say it helped them take fast action after the Sept. 11 attacks. John Stock, vice president of distribution and logistics at HON Industries Inc., says the Muscatine, Iowa-based office furniture maker used a capacity and supply chain planning application from SynQuest Inc. in Atlanta to cut its delivery lead times on rush shipments from two weeks to five days immediately following the terrorist attacks [News, Oct. 1].

Even if a company has the best software in place, the new supply chain environment, which is full of uncertainties, requires changes in the business rules underlying the systems.

"We have to recognize that our supply chains tend to be vulnerable to internal and external threats, so we have to develop techniques to mitigate the risks and exploit the opportunities," Stephens says.

So is the JIT principle dead?

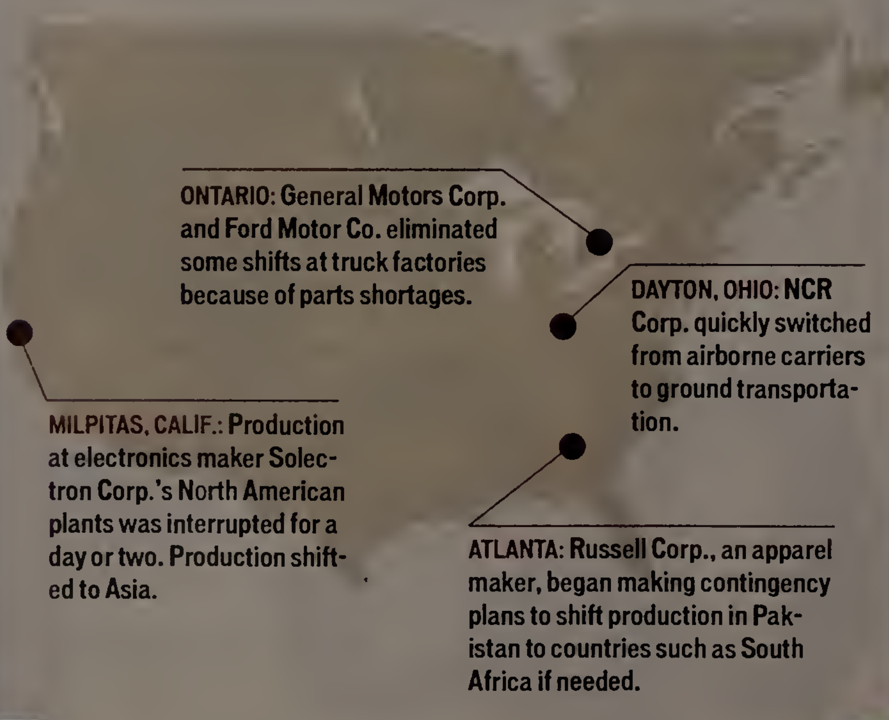
"Zero inventory and JIT never made total sense. The goal isn't zero inventory," says Jeff Kavanaugh, vice president of supply chain management at Inforte Corp., a strategic technology consultancy in Chicago. "If you get there, great, but it's because you've worked something out with your supplier.

"The goal is to make a lot of money while serving your customers," Kavanaugh explains. "If you can make money by having inventory there, always ready, you would. If you can make more money by pushing inventory off to your supplier, you would."

The job for IT managers is to provide business managers with more data and analytical tools so they can make better, information-driven decisions rather than knee-jerk reactions when a crisis develops, Stephens says. "In times of uncertainty, people want something [like data] to bank on," he says. ◗

Ripple Effect

The shutdown of air traffic and extra security at border crossings after Sept. 11 led to the following supply chain challenges:


ONTARIO: General Motors Corp. and Ford Motor Co. eliminated some shifts at truck factories because of parts shortages.
DAYTON, OHIO: NCR Corp. quickly switched from airborne carriers to ground transportation.
MILPITAS, CALIF.: Production at electronics maker Solectron Corp.'s North American plants was interrupted for a day or two. Production shifted to Asia.
ATLANTA: Russell Corp., an apparel maker, began making contingency plans to shift production in Pakistan to countries such as South Africa if needed.

SOURCE PRESS REPORTS SEPT 13 THROUGH OCT 18 2001

MANAGEMENT STRATEGIES

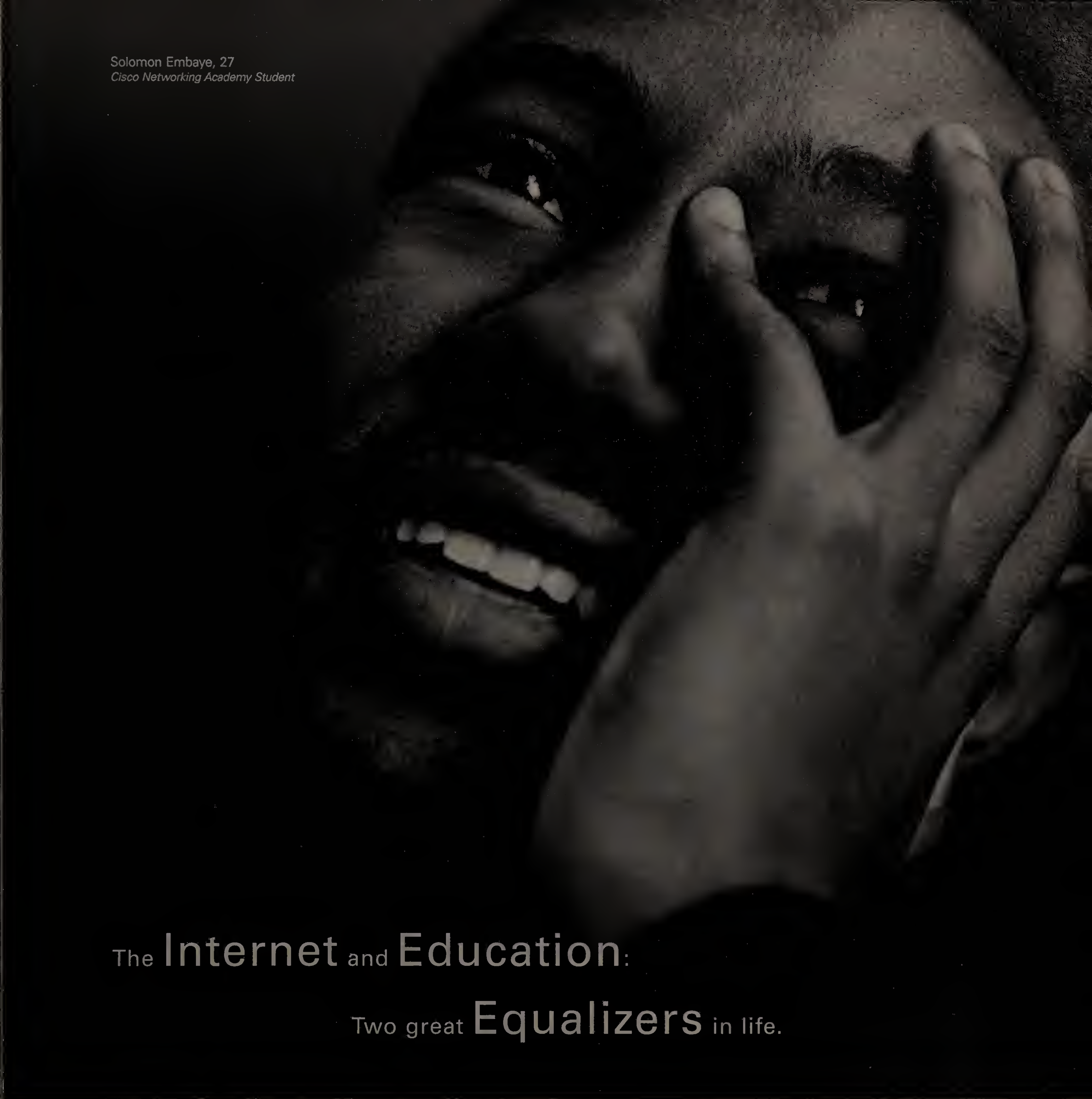
- Redesign the supply chain to balance efficiency with resilience.
- Prepare for higher transportation costs and longer delivery times.
- Have a worst-case contingency plan for every country in which you do business.
- Focus on fewer but more reliable suppliers. Cultivate deeper collaboration with them.
- Make near-real-time visibility into the supply chain your top priority for the next 12 months.
- Stop any "intergalactic" supply chain projects. Focus on smaller, tactical projects with high returns on investment.
- Increase your adoption of supply chain process improvements and technology.

SOURCE: GARTNER INC., STAMFORD, CONN

Online Exclusive

John Simon, an expert on retail supply chains, describes how the retail industry is coping with global uncertainties.

Quick Link **www.computerworld.com/q?25107**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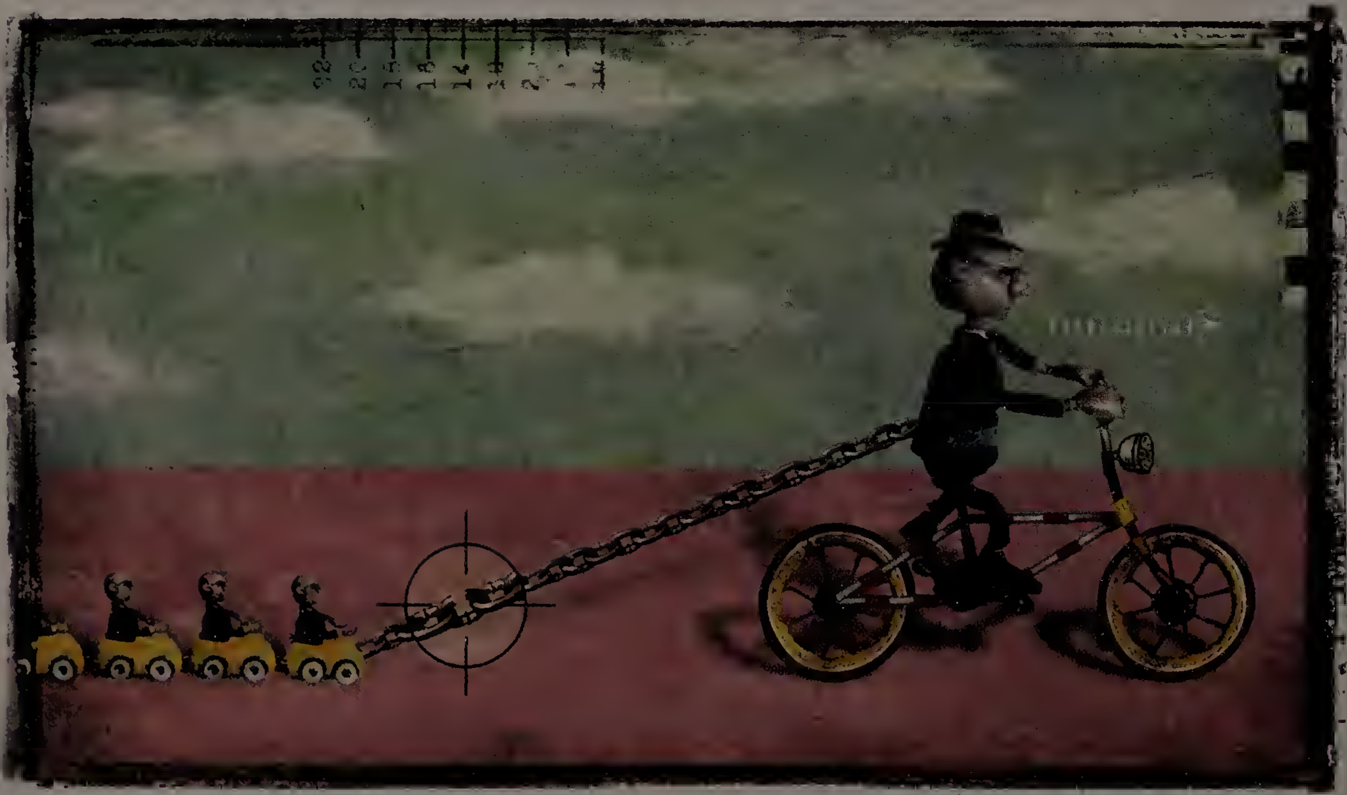
The Wea

It's hard work getting small businesses integrated into the supply chain. Web-based services may help. By Mark Hall



RICHARD BORGE

MOST LARGE COMPANIES' highly tuned IT supply chain engines sputter inefficiently when they have small companies in tow.

By designing sophisticated systems that ignore lower-tier suppliers, business giants can suffer disruptions in product deliveries, unnecessary labor costs and inventory snafus that bog down operations. But even the most sophisticated supply chain system can run into trouble — from delivery disruptions to inventory problems — if it ignores the second- and third-tier suppliers.

A few major retailers and manufacturers have begun to shift their focus to the needs of the little guys, understanding that the electronic data interchange (EDI) capabilities of most small businesses are nonexistent or extremely limited.

But it's not going to be easy.

For one thing, there's the ubiquitous fax machine inside small operations — and that's often the weakest link in a business giant's automated supply chain.

Take American Outdoor Products Inc. in Boulder, Colo., for instance. The 25-person company has been selling freeze-dried meals and munchies to backpackers through retailers for more than 50 years. One of its biggest outlets is Recreational Equipment Inc. (REI) in Kent, Wash., which accounts for 15% of the small company's sales. Until last April, REI had to order the popular food products via fax machine because American Outdoor Products wasn't part of REI's EDI supply chain.

"Faxes came through in giant globs from dozens of stores," recalls Shayleen Snyder, shipping manager at American Outdoor Products. Because each REI store's order form looked alike, her warehouse staff would inevitably confuse one store's request with another's and pack boxes with the wrong materials.

When the mispacked and often mislabeled boxes arrived, labor efficiency and inventory controls suffered while the mess was sorted out, says John Strother, director of inventory and logistics at REI.

Snyder's firm wasn't the only business outside REI's EDI supply chain that was prone to error. That's why REI struck a deal with SPS Commerce Inc., a St. Paul, Minn.-based vendor that specializes in hooking up small businesses to big supply chains using an application service provider model.

Third-party help is the best path that IT managers can take to bringing smaller firms into an automated supply chain, says Larry R. Smeltzer, professor of supply chain management at Arizona State University in Tempe.

SPS links American Outdoor Products to REI through an Internet-based application that translates EDI ordering and shipping requirements so Snyder can access them through a Web browser on her PC. "It stopped the error rate dead in its tracks," she says.

Strother agrees that for small companies, the benefits have been impressive. But the SPS approach has its drawbacks for companies on the cusp of being midsize to large. He says those suppliers are better suited for more traditional EDI technologies.

Also, Strother says he's disappointed that it's taken so long to complete the project. REI started working with SPS late last year and "customization of business rules took several months" to get into the SPS system, he says. Still, it's "going at a pretty good pace," with 250 small suppliers linked to REI through SPS and 130 larger companies using the EDI application directly over a virtual private network, Strother says. He estimates that payback for the SPS investment will be achieved by the second half of next year.

The return on investment may be a little further down the road for Johnson Controls Inc., a first-tier supplier to the world's automotive giants, but it could turn out to be huge.

The $17 billion Milwaukee-based manufacturer does three-fourths of its business supplying 23 million automobile interiors to the likes of General Motors Corp., Honda Motor Co., BMW and other car makers. According to John Waraniak, director of e-business speed at Johnson Controls, car companies have pushed the management of smaller vendors down the supply chain to Tier 1 companies like his.

Waraniak says 80% of Tier 1 suppliers in the automobile market have EDI links to the auto manufacturers. But when you move from Tier 1 to Tier 2, that figure drops to 30%. From Tier 2 to Tier 3, EDI communication is a paltry 2%. Yet Smeltzer says it's the second- and third-tier suppliers "where the critical bottlenecks in manufacturing exist."

That lack of EDI infrastructure in the lower tiers has forced Johnson Controls to re-evaluate how to improve the efficiency of working with smaller operators. Automation of the lower levels of the supply chain should begin where the biggest ROI can be derived, Waraniak argues. For Johnson Controls, that's at the design stage.

"We've moved way beyond EDI," Waraniak says. "We're now into collaboration and knowledge."

HOW TO BRING SMALL FIRMS ON BOARD

1. Make the cost low and predictable. Small businesses simply don't have the budgets, staffers or expertise to implement costly technology. One approach is to deliver technology via a monthly subscription model.

2. Require only minimal changes in behavior. Supply chain integration must be a painless switch from the status quo, with little or no training required.

3. Offer compelling benefits. For a small business, these benefits include the following:

- Eliminating the need to manually keep up with each large partner's terms and conditions.
- Eliminating errors and labor caused by manual re-entry of data.
- Reducing financial penalties for non-compliance.

SOURCE: WHITE PAPER BY LARRY R. SMELTZER, ARIZONA STATE UNIVERSITY, TEMPE.

WHY IT'S IMPORTANT

Including small companies in an organization's supply chain is critical because those outside the chain can create the following unnecessary costs:

- Extra paperwork
- Improper shipments
- Extra labor and resources to manage
- A slow response to change orders
- A crippling affect on production schedules

Automakers are now designing their 2004 models, and one of the best times for manufacturers to save money is before the cars get off the drawing board. "The cost of catching a necessary engineering change at the design stage is a factor of 10. It's a factor of 100 if you catch it in production. If the unit is already in the field, it's a factor of 1,000," Waraniak explains.

"It's absolutely critical that design engineers consider the chain when they create products," says Sean Willems, chief scientist at Optiant Inc. in Somerville, Mass. Willems, who wrote his MIT dissertation on the subject, adds, "Eighty percent of costs are locked in at the design stage."

To manage its costs during design, Johnson Controls uses collaboration software from MatrixOne Inc., a $141 million application vendor in Westford, Mass. With it, Johnson Controls has established a portal that can be accessed by smaller vendors that can bid on projects online without having to make expensive EDI investments. More important, Waraniak says, "they can add value."

As an example, he describes a scenario during the design stage when the position of an instrument panel is altered a few millimeters. "This changes everything in the supply chain, from crash-worthiness to the cost of screws," Waraniak says. With everyone viewing all of the changes in real time through the portal, engineers and suppliers in Tokyo, Detroit and Stuttgart, Germany, can immediately see the implications of the change.

Even with advances in software and connectivity, it's still hard to get every small supplier aboard the automated supply chain, cautions Stephen Cavanaugh, director of IT at Printpack Inc., a $1 billion flexible packaging company in Atlanta.

"The one challenge for suppliers is that they will be expected to understand the planning process and use our information to better plan for our needs," Cavanaugh says. "We have a couple of suppliers that can do that today, but the majority of them still run order to order." ◗

Online Exclusive

To learn how one $9 billion company approaches global supply chain management, read more at our Web site:

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NICHOLAS PETRELEY

CIOs Catch On to SCM Standards

I'VE GOT GOOD NEWS AND BAD NEWS about supply chain management. The good news is that CIOs are demanding platform-neutral, standards-based technologies for the systems they buy. Let's talk about that a bit before we get to the bad news.

At the risk of sounding like a one-tune columnist, I will say this once again: Success in the Internet Age is all about standards, preferably open standards.

OPINION

SCM systems and the Internet are about as perfect a match as you can get, because the Internet is an ideal conduit for business-to-business transactions. Therefore, the success of any given SCM system will be determined by its ability to support standards.

The emerging standards for SCM seem to be Java and XML. Many highly visible companies, such as IBM and Oracle, have pledged support for Java, but it should come as no surprise that Oracle would adopt Java as part of Oracle9i for SCM. IBM has been behind Java from the start, and Oracle will support anything that undermines its chief rival, Microsoft.

It was big news, however, when SAP endorsed Java. Until recently, SAP had a Microsoftian approach to enterprise resource management. It hoped to control the market through its proprietary language, ABAP. SAP hasn't given up hope entirely, so it's continuing to support and develop ABAP. But early last month, SAP CEO Hasso Plattner announced that Java would be SAP's second language.

If you're still not sold on Java as a unifying force for SCM transactions, then note that Plattner was careful to describe Java as the second language it supports, not a language of secondary importance. Java is now equal to ABAP in terms of SAP business priorities.

NICHOLAS PETRELEY is a computer consultant and author in Hayward, Calif. He can be reached at **nicholas@petreley.com.**

To be fair, Plattner also said SAP would support Microsoft .Net. But that's not an indicator that .Net will be a success. Java is already a success. .Net is simply a public relations checkbox item for every company, just in case it does turn out to be a success. That's not to say that .Net has no chance of being one of the next big things, but you can't predict that based on Plattner's remarks. It's just a typical response to any newly hyped technology.

For example, when the Linux hype began to pick up momentum, just about every company on the planet pledged support for Linux. But if you talked to insiders at those companies, you'd find out that they didn't really take Linux seriously until after the 2.4 kernel shipped.

Companies like Oracle, IBM and others were willing to produce Linux products quickly only because it was easy to port their Unix products to the Linux platform. It's not nearly as easy to build on the .Net platform, so I wouldn't advise you to budget for the transition to .Net for at least a few years, which is how long it will take to see whether .Net will fly or flop.

As for XML, my faithful readers already know how I feel. XML is only as standard as you make it. The question of whether XML will be a unifying force revolves around how well vendors create and publish their Document Type Definitions, which is the crucial technology upon which XML depends.

Whether XML makes it easier for SCM systems to interact depends entirely on how vendors address the most common problem posed by the Internet: How do you make money by supporting standards instead of by keeping your intellectual property proprietary?

The answer, for the most part, is to become a service-based company. Most companies that sell SCM software are already heavily service-oriented, which is probably why SAP didn't hesitate to announce public support for Java.

But nobody would have supported Java or XML at all if CIOs and IT didn't demand it. So I see the trend as a sign that CIOs are getting a clue about what makes the Internet useful.

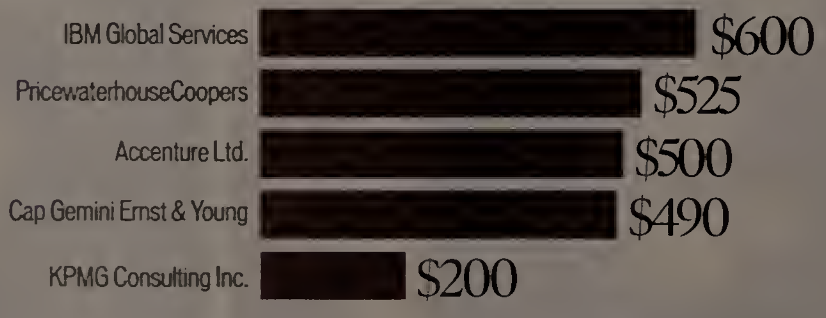
Now for the bad news: At least for now, nobody cares. Gartner Inc. predicts that 2002 IT budgets will rise a paltry 1.5% over 2001 budgets. The Morgan Stanley CIO Survey says SCM ranks 29th out of 34 items on the list of typical CIO IT spending priorities.

So if SCM is a leading indicator that CIOs are interested in standards, it isn't a terribly significant one. ◗

Supply Chain Snapshots

Top Five E-Procurement Service Firms

Revenue in 2000 (in millions)



SOURCE: IDC, FRAMINGHAM, MASS., MAY 2001

Supply Chain Market Segments

The supply chain process management market — also known as event management — is expected to grow 33% per year, though from a small base.

	2000 REVENUE	PROJECTED 2005 REVENUE	ANNUAL GROWTH RATE	COMMENTS
Execution	**$2.7B**	**$4.9B**	**12.6%**	Slow growth because projects have long payback period.
Planning and scheduling	**$1.7B**	**$4.8B**	**22.2%**	Growth rate slowing due to Tier 1 saturation.
Process management	**$126M**	**$518M**	**32.7%**	Emerging market for event management.
Total	**$4.5B**	**$10B**	**17.4%**	Forecast lowered because of recession in manufacturing.

SOURCE: ARC ADVISORY GROUP INC., DEDHAM, MASS., OCTOBER 2001

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Software Engineer (Stamford, CT) (Pharmaceutical industry) Plan, organize & direct functional system analysis; design & implement all assigned software applications; determine business requirements through interviews, observations & review of systems running on Unisys 2200 mainframes to design systems to meet user & corporate requirements; provide written procedures, specifications, instructions & training for end users; provide periodic oral & written status reports to users & top management; provide user training, guidance & support for on-site & off-site locations; monitor performance of installed systems; develop communication interfaces among all related operations to provide timely & accurate information flow; establish formal data flows within & between system operations using applications written in Cobol with interfaces to DMS1100 Database Management System & TIP1100 Transaction Interface Package. Reqs: Master's degree or equivalent in Info. Sci. or Electrical Engr. (will accept as equivalent B.S. in Info. Sci. or Electrical Engr. +5yrs. exp. in progressively responsible positions in the field) and 2 yrs exp. in the job offered or 3 yrs. exp. as a Systems Analyst. Will accept. M-F; 40 hrs/wk; 8am-5pm. Send res. to: S. Roeser, HR Dept., 1 Stamford Forum, Stamford, CT 06901.

F/T Sr. Software Application Engineer. Resp. for designing middleware architecture as well as developing & supporting production of co.'s middleware application systems. Create program specifications from moderate to high quality & prepare feasibility & analysis documentation working w/WindowsNT, Visual C++, MFC, C++, COM/DCOM, UML, ActiveX, ODBC, MS SQL Server, Oracle, VB, VB Script, Crystal Reports & Rational Rose. Resp. for porting applications as well as develop web-based applications & test plans. Assist w/ execution & implementation. Must have Bachelor's degree in CS, Electronic & Comm. Engin. or related field. Foreign degree equivalent accepted. Must have 4 yrs. exp. in job offered or position w/ same duties. Send resume: Vivian Irizarry, United Parcel Service, 340 Winters Ave., A-563, Mahwah, NJ 07430.

Database Administrators needed to install, dsgn, maintain, administer, troubleshoot & create Oracle d/bases. Apply to Global Consultants, Inc., 601 Jefferson Rd, Parsippany, NJ 07054.

Computer Systems Engineer needed for Miami Architecture co. to analyze data requirement and plen data prooessing system for projected workloads. Min req. 4 yrs exp. Send resumes to Architectural Design Consortium, Inc. P.O. Box 370546 Miami, Florida 33137.

Bahwan Cybertek Technologies, Inc. has several openings available for Prog/Sys Analysts, Soft. Engrs/Consultants, Proj Mgrs, DBAs, and Sys Admins to design/ develop applications using skill sets such as: C, C++, VB, VC++, Java, EJB, Oracle, Informix, Sybase, UML, internet, telephony and wireless technologies, Windows/UNIX admin. Require BS/ MS or for. equiv in Comp Sci/ Engg (any branch)/Sci/Math/Bus or related field. Combination of edu and exp will be accepted. Highly competitive salaries & benefits. Travel/reloc required. Resumes to, Suite 215, 209 West Central Street, Natick, MA 01760.

Applicetions Engineer. 8e-5p. 40 hrs/wk. Dsgn, dvlp, implmt & coord integration of wireless applics, systms & eqpmt using comp aided dsgn, comp graphics, mechatronics, digital control systms, networking, C++, Java, JSP/Servlets, SOL, XML, WAP/ WML, HDML, HTML and SMS. Master of Sci or equiv deg in Comp, Electrical, Electronics, Mech'l or related field of Engg. Resume to: HR Dir., Air2Web, Inc., Promenade II, 1230 Peachtree St., 12th Fl., Atlanta, GA 30309.

Bioinformatic Software Validation Specialist, Bethesda, MD. Test bioinformatics software used for seq. analysis & gene expression by bio-medical researchers. Provide scientific sup. to software developers, tech. sup. teams & tech. writing teams to ensure software & tech. docs are scientifically valid & effectively meet the needs of the res. community. REOD: B.S. in Biology & 2 yrs exp. in seq. analysis & gene expression res. using biotechnology. M-F, 40hrs/wk. Send resume to I. Sytnikov, HR, REF. # 502, InforMax, Inc., 7600 Wisconsin Avenue, 11th Floor, Bethesda, MD 20814.

Several FT positions open for exp'ed Project Mangers, Prog/ Sys Analysts, S/W Engineers and DBAs skilled in some of the following: Java, HTML, COM, IIS, ASP; Oracle, Developer 2000, PL/SOL, Power Builder; VB, SOL, Sybase; Windows NT/UNIX admin, web/wireless technologies; datawarehouseing; database admin etc. Require a BS/MS with conc. in CS/Engg (any branch)/ Math, Business or related field. Highly competitive salary. Traveling involved to client sites. Send resume to: Cosyne Enterprises, Inc. 3235 Satellite Blvd., Bldg. 400, Suite 300, Duluth, GA 30096.

Computers/Systems Analysts

CommVault Systems, Inc. seeks Systems Analysts. Resp for analyzing user requ's, procedures & probs to imprv systems. Req: Bach deg in Elec Eng'g, Comp Sci, Math, or rel disc & 2 yrs exp as sys anal, s/ware or h/ware eng'gr. Must have exp w/ Windows NT & SQL, mntng comp ntwks & standalone comps, test envrnmts & implementation. Res to thoffman@commvault.com. EOE.

Computer Programmers. B.S. in Computer Science. 2 yrs. exp. deve., applying, and maintaining heavily used intranet sites; and 2 yrs. exp. with Visual Basic 6.0 (Active X), HTML, CSS, Java Script, VBScript, Transact-SQL, Java-Applets, C, COBOL, and Perl, IIS 4.0/ASP, Microsoft Transaction Server (MTS), Index Server, COM, Windows DNA Architecture, Visual InterDev, FrontPage 98, Dream Weaver 3.01, and PhotoShop, Microsoft SQL Server 7.0, MS ACCESS, and FoxPro, Windows 95/98/NT, BackOffice, Sun Solaris UNIX, DOS, TANDEM, and GARDIAN 90. Send resume: Attn: CPPBN, PO Box 5275, New York, NY 10185-5272.

Systems Analyst needed for Miami computer sales and export co. to review computer system capabilities, workflow, and scheduling limitations. Min req. 4 yrs exp. Send resumes to TWC The Wise Computer, Inc. P.O. Box 226438 Miami, FL 33122.

Semafor Technologies has multiple openings for S/W Engineers, Prog/Sys Analysts, DBAs, Proj Mgrs and Sys Admins to design/ develop/administer software applications using various development tools, languages, database/internet/wireless technologies on windows and UNIX platforms. Customize commercial business application. All positions require BS/MS or foreign equiv in Comp Sci, Math, Business, Sciences, Engg (any branch) or related field. Highly competitive salaries & benefits. Travel/relocation req. Resumes to: HR, 3300 Holcomb Bridge Rd, Ste 212, Norcross, GA 30092

Synergy America, Inc. has multiple openings available for Prog/Sys Anal, S/W Engineers, DBAs and Sys Admin to design/develop applications in some of the following: VB, VC++, SQL, Java, HTML, Oracle, Informix, Sybase, Internet and wireless technologies, Windows, UNIX. All positions req BS/MS or foreign equiv in Comp Sci, Science, Engg, Math or Business. Highly competitive salaries & benefits. Travel/relocation req. Resumes to: HR, 1565 Woodington Circle, Suite 101, Lawrenceville, GA 30044

Several computer related positions

for large telecommunications

consulting services company.

Send resume to: Tangela Burks,

Sema, 6 Concourse Pkwy., Suite

2700, Atlanta, GA 30328.

Database Administrator for lighting manufacturer in Peachtree City, GA. Minimum four years experience designing, installing and maintaining DB2 and IMS databeses on NT, AIX and OS/ 390 platforms, including conducting performance monitoring and tuning, system internal testing and disaster recovery planning and security administration. Send resume to Margaret Abell, Cooper Lighting, 1121 Highway 74 South, Peachtree City, GA 30269.

Programmer/Analyst, Ld. wanted by staffing services org. in Melville, NY. Reqd Bach or equiv in Comp Sci + 3 yrs exp incl. Oracle, Cognos, SOL & Win NT. Fax resume to M. Storelli at (631) 844-7426.

TECH. SUPPORT ENGINEER – Investigate/resolve software problems for Posilion systems; interview users for data collection; handle problem recognition research, isolation; log calls and perform on-site system preparation. Req. B.S. In Engineering, related/equivalent and 1 yr. exp. in job or 1 yr. exp. as Comp./ Software Eng. or related. Send resume to HR, Mosaic Software, 800 Fairway Dr., Ste. 200 Deerfield Beach, FL 33441.

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Senior Security Consultant. Perform audits and analysis of security network infrastructure for highly confidential information in the financial industry. Required: BS/BA in Comp Sci/Bus Admin/Finance/Engineering/Related, and 1 year experience managing internal network and external communication. Chicago, IL. Resume to Logical Networks, Inc., Human Resources, 1750 South Telegraph Road, #300, Bloomfield Hills, MI 48302. No agencies, please.

Software Engineer (St. Louis, MO multiple positions): design, test and implement object oriented management information systems and other software applications utilizing five or more of the following: C/C++, SmallTalk, Java, Unix, Oracle, RDBMS, PL/SQL, Visual Basic, GUI, and Window NT. Require B.S. in Comp. Sci., Elect. Engr., MIS (or in a closely related field) plus 2 yrs. exp. Competitive salary; 40 hr/wk; Mon.-Fri., 8:30 am-5:30 pm. Resume to Ms. Zipfel, HR, NetEffects, Inc., 500 Chesterfield Center, Ste.350, St. Louis, MO 63017. No phone call / EOE.

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Full time Software/Web Developer to plan and develop new computer and web applications using Visual Basic 6.0, C++, Java, HTML, JAVA script, VB Script, MS Access, Oracle and Dbase. Must have Bachelor's degree in IT, CS or related field. Must have 1 yr of exp. Salary: $67,045/yr. Attn: Rashid Malix at Malix Information Technology 6129 Oakbrook Pkwy Norcross, GA 30045.

Several computer related positions for large telecommunications consulting services company. Send resume to: Betsy Moya, Sema, 701 Waterford Way, Miami, Florida 33126.

Sr. Systems Analyst wanted by NJ based Co for job locs throughout the USA. Must have 5 years of exp. in Comp. Software developing and/or consulting and proficiency in X-Base, Clipper, RDBMS, (e.g. SQL Server, MS Access, Oracle). Respond to: HR Dept., Software Galeria, Inc., 373 E Route 46 West, Fairfield, NJ 07004. No phone calls. (Ref: RG7908IM).

"Systems Analyst: ICS, a northern NJ computer consulting firm, requires systems analyst with at least 2 yrs. experience. Skill sets: Powerbuilder; Java; C++; Foxpro; Sybase; Ingres; in Windows/Unix. Please send resume in duplicate to: Indus Consultancy Services, 140 E. Ridgewood Ave, Paramus, NJ 07652" Ref# RX23

Oracle DBA with a Bachelor's degree & 5 yrs of exp. or Masters degree & 3 yrs of exp. Must have certification as an Oracle DBA. Respond to: Configuration Management, Inc., 140 Broad Street, Red Bank, NJ 07701, Fax (732) 450-0715 (no phone calls). (Ref: RG7976IM).

Computer Programmers. B.S. Computer Science. Oracle Certified Database Administrator (Oracle 8). Microsoft Certified Professional in Designing and Implementing Application with Visual Basic 6.0. 2 yrs. exp. maint. and devel. database applications, and database web application development. 2 yrs. exp. as follows: Visual Basic, SQL, HTML, ASP, VB Script, Java-Script, ADO, ODBC, Active X, Oracle 7.3/8, MS Access 97, MS SQL Server; PC/LAN and Microsoft Window system environment. EOE. 40 hrs. per week, 9 a.m. through 5 p.m. Monday through Friday. Send Resume: Attn: ZHCP, PO Box 5275, New York, NY 10185-5275.

Computer Programmer-Convert data from project specifications, statements of problems and procedures to create or modify computer programs & develop /upgrade internet web page using Windows NT in Korean for Bible Broadcasting Co. Confer w/ supervisor about program intent, data input, output requirement. Proficient in Java Scrip, Visual C++, Macromedia Flash, Adobe Photoshop, Illustrator. HS. 2Yrs Exp. $35,470/year. Send resume/coverletter: Bible Broadcasting Network. Charlotte, NC 28241.

divine, inc. computer software applications developers and consultants, are seeking qualified applicants for the following positions: Systems Engineer, Software Engineer, Sr. Consultant, Director of Development and Integrations, Development Director, Loader/Development Team Lead, Gateway Developer and Director. Openings are available at the following locations: Fairfield, CT., Chicago, IL., Denver, CO., Columbus, OH., and Santa Monica, CA. Interested applicants should forward their resumes: divine, inc., Attn: DK 1;3333 Warrenville Rd., Lisle, IL. 60532 or by fax addressed to DK 1 at: 630-799-7508. EOE

Programmer/Analyst wanted in Carrollton, TX. Send resume to: HR Dept. SHC Solutions, 1205 W. Trinity Mills Rd., Suite 214, Carrollton, TX 75006.

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Group Leader, Statistical Programming (Stamford, CT) (Pharmaceutical industry) Design, write, validate & document computer programs using SAS v.6.12 (Statistical Analysis Software) in support of clinical trial analysis & submissions to regulatory agencies. Create, document & maintain SAS analysis data sets during statistical analyses & report generation. Develop, design & validate new programming applications, & update components of existing applications. Provide programming support expertise to bio-statisticians, clinicians & other clinical trial personnel in the monitoring & reporting of clinical trials by creating summary tables, graphs, data listings & analyses for inclusion in integrated statistical/clinical reports. Supervise 2 associate senior statistical programmers. Reqs: M.S. in Statistics, Math or Comp. Sci. + 2 yrs exp. in job offered. 35 hrs/wk; 8am-5pm. M-F. Send res. to: S. Roeser, HR Dept., One Stamford Forum, Stamford, CT 06901.

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Systems Analyst

Analysis, dev. & optimization of complex real-time & mission critical systems for Microsoft Windows NT, 95, 98, ME, CE, Unix; design, analysis & optimi. of network & rel. database, warehouses, OLAP appl., & data analysis solutions based on state-of-the-art methods of C.S & math M.S. in CS or rel. (Ph.D. in Physicomathematical Sci. accept. in lieu of M.S. in CS) & 2 yrs. exp. in above pos. or 2 yrs. exp. as Consultant, Researcher, or rel. w/abil. to use C, C++, Assembler, ASP, network and/or rel. databases, ER design, prog. language parsers, Lex, Yacc, profiling software, applied statistics, numerical methods; time series analysis. 40.0 hr/wk. 9-6. Send resume to: Mr. Alec Goldis, Pres., WebOracle, Inc., 5323 Oxford Chase Way, Dunwoody, GA 30338.

Junior Consultant, Development. Assist in the design, development, implementation and maintenance of company workflow technologies based upon the analysis of company business requirements and the industry's emerging technologies. Work with Consulting Management Team to identify appropriate projects. Involved in all phases of Software Development Life Cycle (analysis, design, development, implementation and maintenance) of company's Internal systems using C++, Visual C++, MFC, COM, XML, ASP, Visual Basic and Oracle. Requires: Bachelor's degree in Comp. or Info. Science, Eng. or related field. 2 yrs. exp. in the job offered or as a Senior Associate, Software Developer or Programmer/Analyst. EOE. 40 hrs/wk. Salary: $65,000/yr. Send resume (no calls) to: KB, HealthScribe, Inc., 403 Glenn Drive, Sterling, VA 20164.

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Programmer/Analysts wanted by cmptr cnsltng co. in NYC to design, develop, test, implement & maint inventory & distrib planning & internet applics. PowerBuilder, Oracle. Internet Dvlpmt exp. Strong relational database knowldg, SQL critical. Excellent commun, intrprsnl & org abilities imprtnt. Competitive salary, attractive benefits packge. Resumes to Vitech Systems Group, 404 Park Ave So, NY, NY 10016.

F/T Web Development Programmer. Responsible for ground-up WEB applications focusing on data publishing, storage & manipulation. Maintain & modify pre-existing applications & provide technical & troubleshooting support. Responsible for database design, modeling & theory & algorithm development/implementation, communication protocols, translation of computer language into applications & integrated development & environments working w/ Java, Java Server Pages, Java Script, SQL/SQL server, IIS 4.0, VB, ASP, COM/DCOM, Crystal Reports and HTML. Must have Bachelor's degree in Computer Science, Computer Information Systems or related field. Employer will accepted Master's degree in lieu of Bachelor's. Must have 6 mos. exp. in job offered or position w/ same duties. Salary: $65,000. Send resume to Ernie Mueller, CMD Services, Inc., 3060 Premiere Parkway, Duluth, GA 30097.

SENIOR SOFTWARE ENGINEER (Boston, MA): Research, prototype, design, develop and test company software; analyze customer requirements and consult with hardware engineers on feasibility of design; design and develop software using Windows NT server development technology, Windows 98 and NT operating systems, web development technology, visual basic, and C/C++ programming; develop and direct software system testing procedures, programming, and documentation, and coordinate installation of all software systems. REQS: BS in Computer Science, Engineering or Math. & 2 years experience in the position offered or 2 years experience as a Software Engineer. Must have knowledge of Windows NT, Windows 98, Visual Basic, and C/C++. Salary $75,000 per year. 40 hrs/Wk. Hrs: 9:00 AM to 5:00 PM, M-F. Send two copies of resume in response to Case # 20015878, Labor Exchange Office, 19 Staniford St., 1st fl., Boston, MA 02114.

COMPUTER/IT
Senior Software Engineer. Herndon, Virginia: Responsible for the full life cycle of product development. Contribute to requirement analysis, architecture and design of Java applications in NT and Unix environment. Design and implement data warehousing and data mining applications. Assist managers with project scoping, scheduling and tracking. Participate in and/or lead requirements, design and code reviews. Mentor less experience software engineers in O-O and J2EE applications. Requires: B.S. or foreign equivalent in Electrical Engineering/Computer Science. 2 yrs. of exp. in job offered or as Programmer Analyst. Experience which may have been obtained concurrently must include: 2 yrs exp. in NT and Unix environment. EOE. 40hrs/wk. Send resume (no calls) to Ms. Andrea Moreno, Human Resources Manager, Focus Technologies, Inc. 13665 Dulles Technology Drive, Suite 200, Herndon, Virginia 20171.

Panteq Communications, a full-service web, multi-media and print design company, seeks to fill the position of Manager, Web & Interactive Media Services in our Roanoke, VA office. Develop and program all aspects of web, multimedia and print user interface design. Position requires degree and work experience. If interested forward resume to: Chairman, Panteq Communications, 6185 Steeple Chase Drive, Roanoke, VA 24018, or email: nimam@panteq.com

Programmer Analyst: Reston, VA: Provide conceptual data processing solutions to customer business problems in mission critical systems such as customer billing, customer svce., mktg. info. systems & svce., materials & financial systems. Provide technical expertise systems consultation, assistance in coding & informal leadership during the systems development, maintenance & production processes. Facilitate efforts to refine business requirements through Joint/Rapid Application Development sessions w/mgmt. & key users. Analyze, code, test & implement solutions to complex technical problems w/team members, clients & vendors. Support the application systems planning process. Conduct & participate in the review, evaluation & recommendation of software products & productivity tools. Bachelor's in Computer Science, Engineering or related field & 2 yrs exp. in the position offered or in a related systems analysis, programming or database admin. position. 2 yrs exp. must include exp. in Windows 2000, Windows NT, MS-DOS, SQL Server, TCP/IP, Visual InterDev, IIS4.0, Visio, C++, ASP, HTML, Java Script and VB Script. MCSE required. Resume to SoltecOne, 11480 Sunset Hills Rd., Reston, VA 20190.

Software Engineer (multiple openings) - Research, design & develop computer s/w systems for business applications; analyze s/w requirements to determine feasibility of design within time & cost constraints; formulate & design systems; develop & direct systems testing procedures; & use COBOL II, DB2, CICS & JCL. Req's. Master's in CS, Systems Analysis, CIS, Comp. Engg., Electrical Engg., Electronic Engg., Mech Engg. or Math or its equiv. in ed. & exp. + 3 yrs. exp. in job offered or 3 yrs. exp. in a related occup. as a Programmer, Programmer Analyst, Systems Analyst. Sr. Systems Analyst, Engineer (Grade II), Software Engineer, Assistant Consultant or Software Consultant. Will accept a bachelor's degree, or a foreign equiv. degree, followed by at least 5 yrs. of progressive exp in the speciality, in lieu of the req'd ed. & exp. $68K/yr., 40 hrs/wk., 8:30a-5:30p, M-F. Report or send two resumes to Gwinnett, Job Order #GA 7039185, 1535 Atkinson Rd., Lawrenceville, GA 30043-5601 or the nearest Dept. of Labor Field Service Office. Must have proof of legal authority to work in the U.S.

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S/Ware Dvlpmt Co in NJ seeks to fill multiple openings for following positions:

S/Ware Engrs, Prog.Analysts, Mgmt Sys. Analysts, duties involve dsgng, dvlpg & testing using any of foll.skills: BPR, ERP & S/ware dvlpmt involving C/S (Oracle applics, Oracle, PL/SQL, PowerBuilder, VB, Visual Foxpro) or E-commerce (Java, EJB, JSP, ASP) on Win, NT/Unix platform.

Project Directors for plg, directing, coordinating & reviewing designated projects, using any of skills above.

Req: Project Directors and S/ware Engrs: Masters or equiv in Math or Sci or Comp Sci or Engg with 3 yrs exp or Bach or equiv with 5 yrs progressive exp in job offd. Prog Analysts and Mgmt Sys. Analysts: Bach or equiv in Math or Sci or Comp Sci or Engg or Commerce or Bus Mgmt/Admin w/1yr exp in job offd. Will also accept 3 yrs college in fields listed or equiv & 18 mos exp in job duties

Respond to: HR Dept, Gebbs Software, 530 Main St., # 4, Fort Lee, NJ 07024 or E-mail to resumes@gebbs.com

Computer

Technical Support Supervisor

Science Applications International Corporation (SAIC), an employee-owned company, provides high-technology services and products to government and commercial customers. SAIC and its subsidiaries have estimated annual revenues of nearly $5.9 billion and more than 40,000 employees at offices in over 150 cities worldwide.

This position oversees technical support requirements, including the development of infrastructure plans, allocation of resources, and supervision of all ongoing computer maintenance; supervises and directs activities of the technical support staff; and coordinates the planning, installation, and configuration of NT server hardware, software and network infrastructure in new facilities.

Requirements include a Bachelor of Science degree in Computer Science or equivalent combination of education and experience, plus a minimum of two years of experience providing information technology technical support in a 50+ server environment with 1,000+ end users.

SAIC offers excellent compensation, career growth, and outstanding benefits, including a stock purchase program and retirement plan. Send resume to HR Recruiter, 5001 Rockside Road, Suite 700, Cleveland, OH 44131, or online at Jeffrey.r.bees@saic.com. SAIC is an Affirmative Action Employer. We value cultural diversity in the workplace.

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PROGRAMMER/ANALYST to analyze, design, develop, test and implement application software for Communication Technology Services in a client/server environment using C++, Java, Servlets, JSP, JDBC, JDK, Forte4j, Oracle, Iplanet WebServer, XML, OrbixWeb, Rational Rose, ClearCase and CORBA under Windows NT, SUN Solaris and UNIX operating systems. Require: B.S. degree in Computer Science/Engineering, Mathematics, or a closely related field with one year of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Roz L. Alford, Principal, ASAP Staffing LLC, 3885 Holcomb Bridge Rd., Norcross, GA 30092; Attn: Job HV.

DATABASE ADMINISTRATOR
Database Administrator to do logical and physical design of SQL Server database; Code test and implement SOL Server scripts applying knowledge of Database Management Systems; Calculate optimum values for SOL Server database parameters; performance tune SOL Server databases; Model SOL Server database security; manage backup and recovery of SQL Server databases; make changes to SOL Server database applications using knowledge of SOL Server 7.0, T/SOL and XML. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a Database Administrator, expertise in SOL Server database administration which includes logical design, physical design, performance tuning, backup and recovery, coding of scripts, knowledge of SOL Server 7.0, T/SOL and XML. Salary: $66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and relocation. Apply: Ms. Barbara Cole, Greene County Team PA CareerLink, 4 West High Street, Waynesburg, PA 15370, Job No. WEB213605.

Programmer Analyst - Oracle Specialist - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance and support of large volume on-line complex integrated client-server based business, financial, banking, manufacturing and other commercial application systems in a multi-hardware/multi-software environment using centralized or distributed database systems using Oracle Relational Database Management Systems (RDBMS) and related software. Design of large application systems and databases in a Co-operative Development Environment (CDE); and analysis, design and development of applications using CASE (Computer Aided Software Engineering) tools. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr. experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 3 of B, or 2 of A and 2 of B. A) includes Oracle RDBMS, Oracle CASE tools (Designer, Dictionary, Generator), CDE 2, Oracle Financials; B) includes PRO*C, SOL*Forms, SOL*Reportwriter, SOL*Plus, SQL*Menu, PL/SOL. High mobility preferred. 40 hrs /week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to: Manager, Washington County Team PA CareerLink, Millcraft Center, Suite 150LL, 90 West Chestnut Street, Washington, PA 15301-4517. Refer to Job Order #WEB 213829.

SENIOR SOFTWARE ENGINEER to design, develop, implement, test and maintain telemanagement application software for the hospitality industry using minimally Progress 4GL and RDBMS V.8 & V.9, Smart Objects, Web Speed 3.1B, WebClient, MS VSS, MS PWS, HTML, XML, Java Script, Socket Programming, TCP/IP and RS232 on Windows NT/2000, UNIX, AIX and AS/400 platforms. Require: M.S. degree in Computer Science/Engineering, or a closely related field with two years of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Dina Gallo Tarro, Executive VP, Systems Design & Development, Inc., 800-A, NW, 17th Avenue, Delray Beach, FL 33445; Attn: Job PB.

Programmer Analyst (IBM Mainframe) - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance, support and conversion of large volume online transaction processing and batch application systems in a multi-hardware/multi-software environment over centralized database systems using relational/hierarchical/network database management systems, Third Generation Languages (3GLs), Fourth Generation Languages (4GLs), CASE tools and Transaction Processing Software. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr. experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 1 of B and 1 of C; or 1 of A and 2 of B; or 1 of A and 2 of C. A includes DB2, IMS DB and IDMS DB; and B includes CICS, IMS DC, IDMS DC, ADS/O, OMF, VSAM and MF-Workbench; and C includes TELON, IEF, ADW, CSP and APS; High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to: Fayette County Team PA CareerLink, ATTN: JS Supervisor, 32 Iowa Street, Uniontown, PA 15401-3513. Refer to Job Order # WEB 214287.

Peoplesoft Project Manager. Duties: Manage the set-up & implem. of PeopleSoft appls. Design, develop & implement financial & payroll systems using PeopleSoft appls. Perform business process & system design, testing & prod. support. Provide detailed design specs to client from a tech. & business standpoint. Create, eval. & manage project budgets & timeframes. Requires: 5 yrs. exp. in the job offered or 5 yrs. exp. as a Software Eng. or Analyst. Concurrent exp. must incl.: 2 yrs. exp. managing the set-up & implem. of PeopleSoft appls. & 2 yrs. exp. designing & implementing financial & payroll systems. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Send resume (no calls) to: Diane Tuccito, AnswerThink, Inc., 817 W. Peachtree St., Suite 800, Atlanta, GA 30308.

Info-Matrix Corporation, a professional information technology consulting company providing a broad range of services including mainframe and client server software design and development, requires skilled programmer analysts, software engineers and software consultants with experience in the following areas:

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- ✯ MS Visual Basic, C++, MS SOL Server
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- ✯ Natural / ADABASE
- ✯ MS Windows NT Administration
- ✯ A-Series and 1100/2200 Operators

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2801 N. Front Street
Harrisburg, PA 17110
Or email to:
Jobs@info-matrix.com

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Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in ATG Dynamo, Oracle, Enterprise Java Beans (EJB) and Roguewave. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of ATG Dynamo, Oracle, Enterprise Java Beans (EJB) and Roguewave. Salary: $100,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Manager, Westmoreland County CareerLink, 300 East Hillis Street, Youngwood, PA 15697, Job No. WEB213597.

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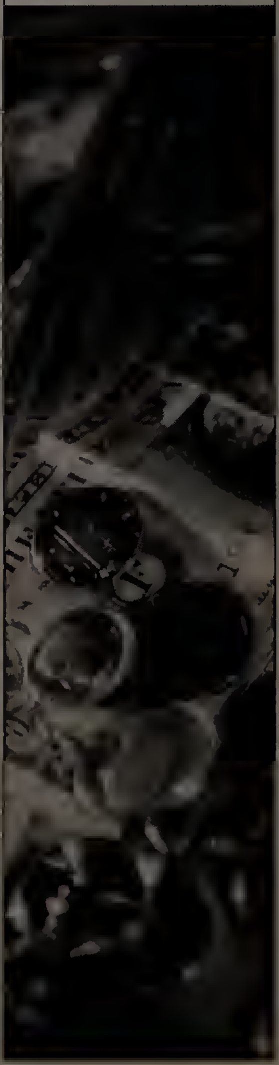

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Subscription rates: U.S., $68/year; Canada, $110/year; Central and South America, $250/year; all others, $295/year

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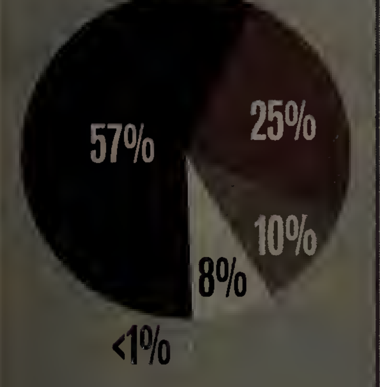
HP/Compaq

to the HP 9000 Unix server, said Jim Johnson, systems manager at Thermo-O-Link.

"I'm having a hard time trying to figure out what HP's core business is, and they haven't communicated that clearly," Johnson said. "I can't bet the company on a 9000 server that they may discontinue in nine months." Instead, he added, hardware from IBM or Dell Computer Corp. is at the top of his evaluation list.

Seven other users also said the continued uncertainties surrounding the planned merger are a cause for concern. John Moon, CIO at Baxter International Inc., said he wants the controversy to be resolved quickly because it's hard to determine which products will be supported by the combined company, or by either HP or Compaq should they go their separate ways.

Who Owns HP?



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"We've been stung in the past and [again now] with the economic downturn, so we spend a lot more time trying to understand how our key suppliers are positioned in the market," said Moon. Baxter, a $7 billion medical services company based in Deerfield, Ill., buys its laptops, desktops, servers and help desk services exclusively from Compaq.

Webb McKinney, president of business operations at HP, reiterated that the merger would strengthen the ability of the two vendors to serve large customers. "The remaining 82% of shareowners have not made preliminary statements as to how they will vote," he added.

But Paul McGuckin, an analyst at Gartner Inc. in Stamford, Conn., said the battle between HP's management and members of the Hewlett and Packard families will make swaying the institutional investors that hold 57% of HP's stock much more difficult.

McGuckin also cautioned users about making investments in Compaq's Tru64 and OpenVMS operating systems and HP's midrange storage products, which might not survive if the merger goes through. "It's not a compelling story for users," he said.

Merger Hurdles

Winning shareholder and regulatory approval for the merger presents as many potential problems as scrapping the plan would.

For starters, antitrust concerns by the Federal Trade Commission may force HP and Compaq to sell overlapping high-end server lines. Some users are worried about investing in technology that might get divested.

"Users need to have a contingency plan, regardless of the outcome of the merger," said Rob Enderle, an analyst at Giga Information Group Inc. in Cambridge, Mass. "In the current environment, we're dealing with a risk-averse audience, and they don't want to put their jobs on the line for a company that may not be able to execute."

According to a Giga survey last week of IT executives who are currently purchasing technology products, about one-third said they wouldn't buy HP or Compaq products due to merger concerns.

"If the merger goes through, HP will grow by sheer size, but they're just gaining bulk," said Steve Willard, plant manager at Spectra American Color Lab Inc. Willard said Sun Valley, Calif.-based Spectra is contemplating a move from Compaq's AlphaServers to hardware from IBM or Mountain View, Calif.-based Silicon Graphics Inc., due to concerns about the merger and Compaq's planned transition of the machines to Intel Corp. processors. ◗

Does Compaq Have a Backup Plan?

The David and Lucile Packard Foundation in Los Altos, Calif., announced its opposition to the proposed merger in a letter to HP's board of directors on Dec. 7, an action that caught the attention of Compaq CEO Michael Capellas.

In a memo sent the same day to Compaq's 95,000 employees, Capellas said Compaq sought the merger to meet certain objectives, such as improving its PC business and expanding its services arm. But the note also stated that the company would "maintain a pragmatic view" of its future.

"But regardless of the circumstances – whether we are part of the new HP or a stand-alone company – I am confident in our ability to achieve these objectives," Capellas wrote in the memo.

Although officials denied that Capellas was distancing Compaq from the merger, some users saw it differently.

"I'm not an expert, but it sounds like [the merger is] over," said John Moon, CIO at Baxter International. "When you have Michael Capellas talking about a Plan B publicly, well, we're just waiting for the last shoe to drop."

Compaq officials said they disagreed. "There is no hidden agenda or secret Plan B," said Arch Currid, a Compaq spokesman. "It would be irresponsible not to have contingency ideas in mind in the event that something could happen, but Compaq is not ready to execute on a Plan B."

Still, some customers wondered how much the merger controversy will distract Compaq's management from immediate business priorities.

Jim Kasdorf, director of special projects at the Pittsburgh Supercomputing Center at Carnegie Mellon University, said the hours devoted by Compaq executives to merger-related issues are "time that's not spent thinking about how to serve the customers best."

– Lee Copeland

Aetna to Cut 150 IT Jobs in Restructuring

Insurer says layoffs won't affect CIO's plans

BY TODD R. WEISS

ABOUT 150 IT workers at Aetna Inc. will lose their jobs next year as part of a planned 6,000-employee cutback that was outlined last week by the country's largest medical insurer.

Hartford, Conn.-based Aetna said the cuts will include IT operations workers, business system analysts and staffers who provide desktop and networking support services. The layoffs will reduce the company's 3,000-person IT workforce by 5% — smaller proportionally than the 16% reduction Aetna is making overall.

Aetna, which has been hit by three straight quarters of operating losses, is pinning much of its hopes for a recovery on a plan that's aimed at tightening ties between the IT department and the company's business units. Wei-Tih Cheng, who took over as Aetna's CIO in April, last month detailed a strategy to reorganize IT into six groups dedicated to specific technology services.

Aetna spokesman Fred Laberge last week said the upcoming job cuts in IT shouldn't have a significant impact on Cheng's plan. The IT positions that will be eliminated were already being discussed by Aetna executives when they planned the organizational changes, Laberge said.

The cutbacks are being made to better match Aetna's workforce to a reduction in the number of customers in its health plans, the company said.

The IT workers being let go will be part of a group of 4,400 employees who will lose their jobs through layoffs by the end of next year, according to Aetna. Another 1,600 jobs are scheduled to be trimmed through attrition. ◗

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FRANK HAYES/FRANKLY SPEAKING

Santa's IT Checklist

THINGS WERE QUIET in the North Pole workshop. Too quiet, Santa thought. Sure, there was all the usual bustling around with the big night just over a week away. But there was none of the usual chatter, the whistling, the sound of that little dance the elves used to do when they finished a toy. "It's like everyone's worried," he said.

"What would they have to be worried about?" asked the elf at the keyboard. "I mean, besides being laid off the day after Christmas?"

"Nothing's been decided," Santa answered. "Besides, you're all fully vested. But it's too bad so much of the pension fund was in dot-coms. I recommended against that, you know."

"Yeah," said the elf. "And it's too bad we've got a boss who spends the whole year keeping track of who's naughty or nice, then picks the holiday season to say 'I told you so.' Now, are you gonna keep procrastinating, or will you tell me what these technology bigwigs are supposed to get?"

"Hmm," said Santa, "Bill Gates already got everything he wanted this year, didn't he?"

"Pretty much," the elf said. "He got a cream-puff settlement with the Justice Department, the punishment in his class-action lawsuits is that he gets to take over the education market, too, and his Xbox is the second-hottest toy out there this season. What do you give the guy who has everything?"

"A Nintendo GameCube?" Santa suggested.

"Or maybe acting lessons — I saw him on *Frasier*," said the elf. "And how about torches and a DVD of *Frankenstein* for each of the nine state attorneys general, the Senate Judiciary Committee members, the California class-action suit lawyers and Steve Jobs?"

"Sure," said Santa. "Though considering what happened to PSINet and Enron, I'd say if they really want to break up Microsoft, they should name a ballpark after it. Who's next? Carly Fiorina and Michael Capellas? They *thought* they had everything, didn't they?"

"Love'll do that to you," the elf grumbled. "Let's try copies of *Can This Marriage Be Saved?* for them and everybody else in the Hewlett and Packard families."

"Done," said Santa. "And what about Larry Ellison and Scott McNealy? They're both very big on ID technology."

"Larry just gave that database to the feds because he needs a bigger little black book himself," the elf said. "And for Scott, a bar-code reader so he can keep track of his kids. And I heard IBM got a whopping bill for its Linux graffiti ad campaign in San Francisco. Washable crayons for them?"

"Fine," Santa said, "and a copy of Bill Gates' videotaped deposition for Charles Wang to learn from, now that the Justice Department is dragging Computer Associates into court on charges of price fixing."

"Everybody wants to be like Microsoft," sighed the elf. "What about all the dot-com employees whose companies were saved by brick-and-mortar competitors that bought them up?"

"Ties — lots and lots of ties," said Santa. "And walkie-talkies for the Interior Department bureaucrats who got unplugged from the Internet because their bosses didn't keep track of money belonging to Indian tribes."

"For those Israeli high school kids who created the Goner worm?" the elf asked.

"Detention," said Santa. "But a fistful of prepaid phone cards for Adrian Lamo, that wandering hacker who found all the security holes in WorldCom's network and then helped fix them."

"OK," the elf said. "And what about all the H-1B IT workers who are out of work?"

"What about *all* the corporate IT people, period?" asked Santa. "They got us through Y2k and Sept. 11, and now they're worried about war and losing their jobs."

"Peace on Earth won't fit on the sled," answered the elf. "How about no more layoffs?"

"Ho ho ho," said Santa. "Is that for them — or for you?"

"That," said the elf, "is for everybody." ◗

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at **frank_hayes@computerworld.com.**

SHARK TANK

NOT LONG AFTER this military base replaces its mainframe terminals with Unix workstations, contractor pilot fish gets a call from one user: He wants his 3270 back. "Turns out users were performing mainframe queries that took hours to complete," reports fish. And for security reasons, users were required to "guard" their terminals while logged in. "They used the guard time to complete homework for their college classes," fish says. "With workstations, they were told to open a new window and perform other work."

IT PILOT FISH delivers the replacement printer this supervisor requested, but asks why he needs it. "It doesn't work," supe says, "and repairing another printer in my department cost almost half what I paid for a new one." So fish makes the swap, "but I haven't found anything wrong with it," he says, "other than the empty ink cartridge."

SUPPORT CONSULTANT pilot fish is handed a complex six-part query with a Friday deadline. It's too complex a request for me to finish by Friday, fish protests – you'll have to split it up and spread it out. Two days later, he gets the same assignment again. "Only now it's been cut and pasted into six individual queries," fish says. "And all of them are due on Friday."

A FEW YEARS back, systems analyst pilot fish's CD-ROM drive breaks, and skinflint boss won't approve $50 for a new drive. "I get embarrassed every time a consultant comes with a CD and I've got to excuse myself to load it on someone else's computer," fish grumbles. Finally, he gets a new PC with a CD-ROM drive. "But wouldn't you know it," fish says, "the first unsolicited software disk I receive in the mail is from Microsoft – in DVD format!"

I prefer e-mail format: **sharky@computerworld.com.** You get a sharp Shark shirt if I use your true tale of IT life. Shark Tank won't be back until the Jan. 7 issue, but in the meantime, you can still catch the daily feed at *computerworld.com/sharky.*

The 5th Wave

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"I hear some of the engineers from the mainframe dept. project managed the baking of this year's fruitcake."

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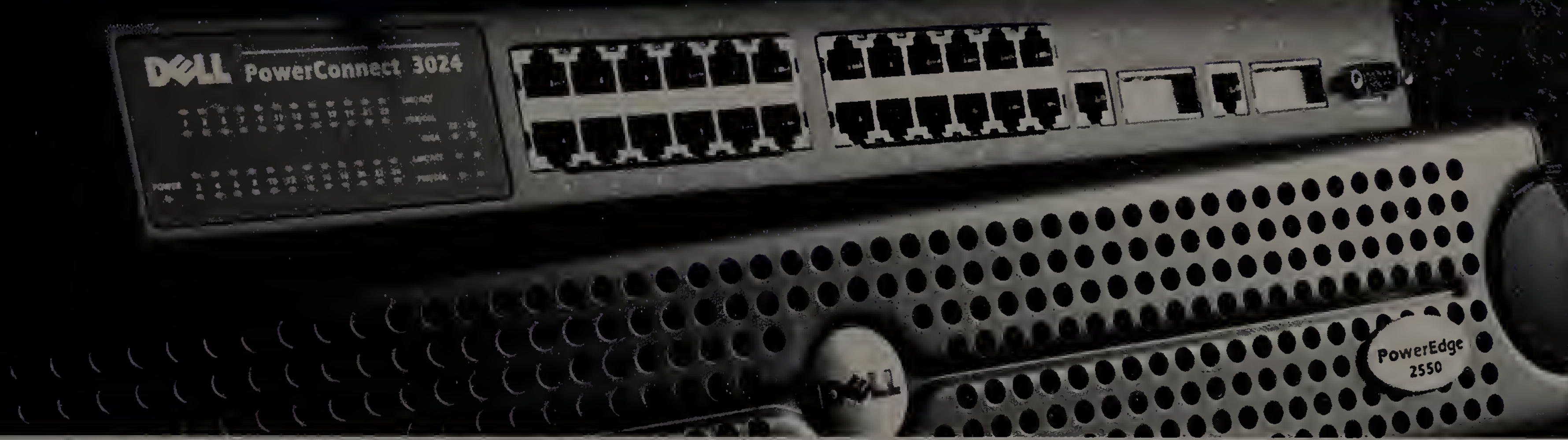

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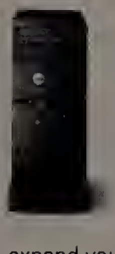

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